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CAPTAIN J. LORT STOKES, AND COMMANDER BYRON DRURY.
1848—55.

ORIGINALLY COMPILED BY
CAPTAIN G. H. RICHARDS AND F. J. EVANS, MASTER, R.N., 1856.

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THE New Zealand Pilot contains Sailing Directions for the New Zealand group of islands, and has been derived from surveys made by order of the LORDS COMMISSIONERS of the Admiralty, between the years 1848 and 1855, in the *Acheron*, Captain J. LORT STOKES and the *Pandora*, Commander BYRON DRURY.

The surveys of the *Acheron* comprised the chief part of the coasts and harbours of the Middle and South (Stewart) islands, along with Cook strait; and two portions of the North island; from Doubtless bay to Mercury islands, and from cape Kidnappers to cape Palliser on the east side; and from thence to New Plymouth.

Detached parts of Hauraki gulf, and the coasts from Mercury bay to cape Kidnappers on the east side, as also the west and north coasts of the North island from New Plymouth to Doubtless bay, with Pelorus sound in the Middle island, and the islets called the Snares, lying southward of Stewart or South island, were surveyed in the *Pandora*, by Commander DRURY, who drew up Sailing Directions for these portions of the coast, which were promptly rendered available to the navigator by being officially published in the New Zealand Gazette.

The various notices and directions resulting from the above surveys were compiled by Captain G. H. RICHARDS, R.N. (who furnished a large portion of original remarks) and Mr. FREDERICK J. EVANS, Master, R.N., officers engaged in the surveys of the *Acheron*.

The present edition (fifth)—containing also a description of Chatham islands and the off-lying islands southward of New Zealand—has been revised by Staff Commander J. H. ELLIS, R.N., from the latest Reports and Surveys made by the New Zealand Government as also from additional information in the Hydrographic Office.

F. J. E.

Hydrographic Office, Admiralty, London,
August 1883.

CONTENTS.

INTRODUCTION.

Page
Discovery of the islands; subsequent exploration; labours of Church mission; general remarks - - - - - - 1
North, Middle, and South or Stewart islands, their geological formation, number and distribution of harbours - - - - - 2–4
The provinces Auckland, Hawke bay, Taranaki, and Wellington, Nelson, Marlborough, Canterbury, Otago, and Westland, their capabilities and European population - - - - - - 5–11
Native population - - - - - - - - - 12, 13
Shipping; imports and exports; telegraph stations - - - 13, 14
General signals for all New Zealand ports - - - - - 15, 16

CHAPTER I.

NORTH ISLAND.

FROM THREE KINGS ISLANDS TO HAURAKI GULF, INCLUDING AUCKLAND HARBOUR AND ITS APPROACHES.

Making the land from the westward; Three Kings islands; coast from North cape to cape Brett - - - - - - - 17, 18
Poor Knights, and Moro-tiri islands; Moko-hinou and Fanal group; Little Barrier island; Hauraki gulf; Kawau island - - - 18–20
Flat rock; Tiri-tiri island and light; Shearer rock and buoy; Wangaproa passage; Rangitoto island and Rangitoto channel dangers - 20–23
Auckland harbour, and its approach; Bean rocks and light; Waitemata river; Outside anchorage - - - - - - - - 23–26
Koreho and Hieh channels; Koreho shoal; Tehmaki, and Waiheki channels; Shell bank; Tekmaki and Wairoa rivers - - - 27–29
Passage, and Sunday rocks; Single rock; Tarakihi islet; Sandspit passage and light; tides in Hauraki gulf, and on east coast of North island - - - - - - - - - - 30–32

CHAPTER II.

THE COAST FROM CAPE MARIA VAN DIEMEN TO CAPE BRETT, BAY OF ISLANDS—FROM CAPE BRETT TO AUCKLAND HARBOUR—THE FRITH OF THAMES.

Page

Strong tides and currents on north coast; cape Maria Van Diemen and light: Pandora bank; cape Reinga and Columbia reef; Spirits bay 33, 34

Tom Bowline bay; North cape; Parenga-renga harbour - - 34, 35

Great Exhibition bay; Ohora bay and river, anchorage - - - 35, 36

Cape Kara-kara; Rangaounou bay and river - - - - 36, 37

Matai bay; Orurua village, native supplies, bay; Doubtless bay; Monganui harbour; Taipa river - - - - - - - 37–39

Flat head; Wangaroa bay and harbour; Stephenson island; anchorage in Kaouou bay; anchorage outside - - - - - 40, 41

West bay, anchorage in westerly winds; Arrow rocks; Flat island; Cavalli islands and passage; Tako bay - - - - 42, 43

BAY OF ISLANDS.

Bay of islands, general description - - - - - - 44

Cape Wiwiki; Galakek island; Nine-pin rock; Motu-roa island; Black rocks; Tepuna bay; Tepahi islands; Porae-nui point - - 44, 45

Onslow or Howe rock, with directions for clearing; Brothers and Slains Castle rocks with directions for passing on either side; port Tepuna and anchorage - - - - - - - - - - 45–47

Keri-keri river; Kent passage; Tapeka point; Manawaroroa point; Brampton or Favourite bank with clearing marks - - - 47, 48

Port Russell (Kororarika bay) and anchorage, directions for entering; Hermione rock - - - - - - - - - 48, 49

Motu-mea island; Waitangi river; Paihia islet, village and mission station; Toré-toré peninsula and Wahapu bay - - - 49, 50

Waikari and Kaua-kaua rivers; anchorage in the Waikari; Kaua-kaua river coal mines, quality of coal - - - - - - 51, 52

Bank of 15 feet off port Russell; directions for clearing it; town of Kororarika or Russell, stores and supplies to be obtained; resident magistrate; settlers - - - - - - - - - 52, 53

Eastern portion of the bay of Islands; the Rawiti anchorages, and passages leading to with directions; Islands, Whale rock - - 53–55

Dangers in the Rawiti; Capstan rock; Paroa and Manawara bays, with directions for entering - - - - - - 55–57

Page

Parekura and Waipero bays; Makiwi cove; Albert channel, not to be attempted without a leading wind; Hope reef; small craft anchorage on south side of Orupukupuku islands; Richards peninsula; Deep-water cove; Twins rocks - - - - - - - - 57–59

Piercy islet; bird rock; cape Brett; directions for entering the bay of Islands from the southward; tides; winds and weather - - 59, 60

FROM CAPE BRETT TO AUCKLAND HARBOUR.

Inshore courses from cape Brett into the Hauraki gulf; Wangamomoo harbour, and coast to the southward - - - - - - 60, 61

Bland bay; Danger rock; Wangaruru harbour, directions and anchorages; Mimiwanga bay; Wide-berth islands - - - - 62–64

Elizabeth reef; Four islets; Sandy bay; Three-gables; Tutukaka harbour with directions; Nongodo river - - - - 65, 66

Bream head; Wangari bay, harbour, river, and anchorages, with directions; Ruakaka and Waipu rivers; Mackenzie cove; McGregor rock 67–73

Bream tail to Rodney point; Mangawai river; Takatau point; Oma bay and cove; Kawau island - - - - - - 73, 74

North channel leading to Kawau bay and Bon Accord harbour; Maori rock, with directions for clearing; other dangers; directions - - 75, 76

Bon Accord harbour; Martello rock; Mayne islands; Eclipse shoal; North and Dispute coves; Nelson rock; Flat rock - - - 76, 77

Tides in Kawau channels; South channel leading to Kawau bay and Bon Accord harbour with directions; Albert shoal, with marks for clearing - - - - - - - - - 78, 79

Motu-ora and Kaitu-kala islands; Inner channel leading to Kawau bay and Bon Accord harbour; Kawau bay; Maurhangi harbour, river, and coast southward - - - - - - - - 79–81

Wangaproa peninsula, anchorage on both sides of; Tofino bay - - 82

Cape Colville; Coromandel and Tekomi harbours, with directions; Menia bay; Middle bank; coast to Grahamstown; lights and wharf; river Thames, bar, tides, directions; Piako and Pukorokoro rivers Frith directions and anchorages - - - - 83–88

CHAPTER III.

GREAT BARRIER ISLAND—COAST FROM CAPE COLVILLE TO EAST CAPE, INCLUDING THE ISLANDS AND ROCKS IN THE BAY OF PLENTY—EAST CAPE TO MAHIA OR TERAKAKO PENINSULA—MAHIA PENINSULA TO CAPE PALLISER.

Great Barrier island, general description; Moko-hinou and Fanal islands, with outlying dangers; Horn rock - - - 89

Western coast of Great Barrier island; Catherine bay; port Abercrombie; Nagle cove; port Fitzroy; False head - - - 90, 91

Page
Pig islands; Wangaparapara harbour; Pirogue rocks; Okupu bay; port Tofino; cape Barrier; detached rocks, and foul ground off - 92, 93
East coast of Great Barrier island; Arid island; tides - - - 94
Coast from cape Colville to Mercury bay; Channel islet; Cuvier island; Charles cove; Kennedy bay; Wangapoa river; Mercury islands - 94–96
Richards rock; Koruenga islets; Mercury bay, directions for entering, and anchorages; Cook's bay, and Mangrove river - - - 96–99

BAY OF PLENTY.

Castle island; Alderman islands; Tairua river; Shoe and Slipper islands; temporary anchorage under latter in fine weather - - 100, 101
Whangamata river, anchorage outside with off-shore winds; Kati-kati river; Tauranga harbour, with directions for entering; tides; mount Monganui - - - - - - - - - 101–105
Motiti island; Kaituna river, navigable for boats; Maketu pah; Waihi and Matata rivers; white cliffs - - - - - - 106
Mount Edgcumbe; Whale island (*Motu-hora*); Ru-rima rocks; Whakatane river, navigable for coasters; Ohiwa and Opotiki rivers; Church mission - - - - - - - - 106–107
Coast from Opape point to cape Runaway; tides; Omaio village; Motu-nui peninsula, with anchorage for coasters; Wangaparawa roadstead, anchorage - - - - - - - - 108-110
Cape Runaway to Hicks bay; Lottin and Midway points; Hicks bay, secure anchorage with westerly winds - - - - - - 110
Kawa-kawa roadstead, anchorage with S.E. winds; Awatere river; Wharekahika village, native supplies - - - - - - 111
From Hicks bay to East cape; aspect of land; East cape islet, anchorage; winds; tides - - - - - - - - 111, 112

ISLANDS AND ROCKS IN BAY OF PLENTY.

Enumeration of; Alderman group, and off-lying dangers; Shoe and Slipper islands; Mayor island, temporary anchorage; Karewha and Motiti islands, dangers - - - - - - - 113, 114
Schooner rocks; Astrolabe rock, with marks for; Plate island - - 114, 115
Whale island (*Motu-hora*), Ru-rima rocks; White island, an active volcano; Valkner islets - - - - - - - 115–117

FROM EAST CAPE TO MAHIA OR TERAKAKO PENINSULA.

Wai-apu river, unsafe anchorage; Eclipse rock; Whárariki point; Reporua village; Kaimouhu head; Open bay, anchorage with off-shore winds; Tokomarua bay, dangerous anchorage - - 117–119

Page
St. Patrick's cove, shelter for boats; Waipari bay; Marau bluff; Tolago bay, anchorage with westerly winds; Cook's watering cove - 119, 120
Motara bluff and islet; Gable-end foreland; Poverty bay; anchorage dangerous with S.E. winds; rivers in Poverty bay; light; Gisborne; Church mission; tides - - - - - - - 120–123
Ariel rocks, with marks for clearing; Mahia or Terakako peninsula; Wangawai road; Portland island; light; general remarks on approaching the coast - - - - - - - - 124–126

FROM MAHIA OR TERAKAKO PENINSULA TO CAPE PALLISER.

Hawke bay and anchorages; Long point roadstead; Wairoa and Mohaka rivers; Ahuriri or port Napier and roadstead, lights, &c.; Ahuriri to cape Kidnappers - - - - - - - 127–132
Cape Kidnappers to cape Turnagain, boat landing north of cape; cape Turnagain to cape Palliser; Castle and Flat points; cape Palliser, rocks and reefs off - - - - - - - - 132–135

CHAPTER IV.

COOK STRAIT.

CAPE PALLISER TO NEW PLYMOUTH.

General remarks; Palliser bay; Wairarapa valley; Taourakira, and Baring heads; dangers; Fitzroy bay and anchorage - - 136–138
Port Nicholson;—Pencarrow head and light; Palmer head; Barret reef; Chaffers passage - - - - - - - - 138, 139
Main channel to port Nicholson; Young bay; Ward island and Hope shoal; Evans bay, patent slip; Lambton harbour, marks for anchorage; piers and lights, &c.; river Hutt - - - - 140–143
Somes island and light; tides in port Nicholson; best course to be pursued by vessels meeting gales in Cook strait - - - 143–146
Prevailing winds; coast westward of port Nicholson; Lyall bay; mount Albert and signal station; Karori or Seal rock; Luna rock; Toms rock, and marks to clear it, also a sunken rock south of Toms rock - 146, 147
Cape Terawiti; making port Nicholson from the westward; tides, and heavy ripplings in the centre of strait - - - - - - 148, 149
Coast northward of cape Terawiti; Oharui bight, boat landing; Porirua harbour; Mana island and anchorage - - - - 149, 150
Coast northward of Porirua harbour; Waikanai river; Kapiti island and anchorages, with directions for; tides - - - - 150–152
Coast northward of Kapiti island; Otaki and Oahau rivers; Manawatu river, light and directions; Rangitiki river; Wanganui river and lights, directions for entering; tides; town of Petre - - - 152–15

Page

Coast from Wanganui river to New Plymouth; Patea river and lights, directions; Waimate bight and pah; Opunake bay and directions - 156–160

Cape Egmont and light; mount Egmont; New Plymouth roadstead, light, dangers, anchorage and directions; Sugar-loaf islands; General remarks, winds, weather, tides - - - - - - 160–166

CHAPTER V.

COOK STRAIT.

FROM CAPE CAMPBELL TO CAPE FAREWELL, INCLUDING BLIND AND MASSACRE BAYS.

Cape Campbell, light, anchorage in bight to the westward; soundings and heavy tide ripplings in strait; White bluff; Cloudy bay, anchorage in; Wairau river, navigable for small vessels; port Underwood, good port of refuge - - - - - - - 167–170

Wellington head; Tory channel, beacon lights and directions; cape Koamoroo, with dangers off - - - - - - - 170–172

Brothers islands and light, dangers in vicinity; Cook rock, with directions for clearing - - - - - - - - 172, 173

Queen Charlotte sound, with directions for entering; bays, anchorages, and dangers within; Ship cove; tides and winds - - - 174–178

Port Gore, with its anchorages; Waitui bay; Guards bay, and anchorage - - - - - - - - - 178, 179

Pelorus sound, general character of country; entrance on either side Chetwode islands, half-tide rock in western passage, with directions for clearing; depth of water; bays and anchorages; tides and winds - 179–183

Admiralty bay; Trio islands; Jag rocks; D'Urville island and harbours; Stephens island - - - - - - 184

Rangitoto roadstead, anchorage with westerly winds; tides; port Hardy with directions - - - - - - - - 184–186

Greville or Brooke harbour; Current basin and French pass, with directions for; peculiarity of tides; excellent fishing place - - 186–188

BLIND BAY FROM D'URVILLE ISLAND TO MOTUEKA RIVER.

General remarks; enumeration of anchorages - - - - 188, 189

Croisilles harbour, port of refuge; directions for entering; Pepin island 189, 190

Nelson haven, pilot necessary; light; directions for entering; anchorage outside bar; tides; vessels may beach for repair; Bolton Hole anchorage; Waimea river - - - - - - - 190–193

BLIND BAY, FROM SEPARATION POINT TO MOTUEKA RIVER.

Page
Separation point; remarkable white stripe available as a clearing mark for the end of Farewell spit; Awarua bay and anchorage; Tonga roadstead - - - - - - - - - 194
Torrent bay; Astrolabe and Fisherman roads; tides and currents in Blind bay - - - - - - - - - 194–196

FROM SEPARATION POINT TO CAPE FAREWELL.

Massacre bay, general description; mount Burnett; cape Farewell; Farewell spit and light; Tasman corner; directions for anchorage; heavy surf on beach; boat's crew lost - - - - 196–198
Aroèrè river; Coaling road, anchorage; Tata islands and anchorage; directions for entering Massacre bay; tides; directions for entering Cook strait from the south-westward - - - - 198–200

CHAPTER VI.

FROM CAPE MARIA VAN DIEMEN TO NEW PLYMOUTH.

Cape Maria Van Diemen; Pandora bank; coast to Reef point; Ahaipara roadstead; Reef point; False Hokianga, Wangape - - - 201–203
Hokianga river, general description; bar; directions for entering; signals; Martin bay; narrows; anchorage; creeks and tributary rivers; tides, fogs, winds; general remarks - - - - 203–210
Coast from Hokianga river to Kaipara harbour; Monganui bluff - 210
Kaipara harbour; general description; marks for entrance; bar; channel into, with directions; anchorages; tides - - - 211–217
Coast from Kaipara to Manukau harbour - - - - - 217
Manukau harbour, general remarks; signals; entrance; light; bar; channel directions; tides; inner waters of - - - - 217–225
Coast from Manukau harbour to Waikato river; Waikato river with directions; coast southward; Whaingaroa harbour, directions for entering - - - - - - - - - 225–228
Gannet island; Aotea harbour; outlying rocks; directions - - 228–230
Kawhia harbour; its approach; directions for south and north channel 230, 231
Coast southward of Kawhia harbour; Albatross point; Marakopa river; Mokau river; white bluff; Waitera river, signals and directions - 231–234

CHAPTER VII.

MIDDLE ISLAND.

EAST COAST OF MIDDLE ISLAND—FROM CAPE CAMPBELL TO THE EASTERN ENTRANCE OF FOVEAUX STRAIT.

Cape Campbell and outlying rocks; coast to Kaikora peninsula; Waiharakaka river, and anchorage off; Flaxburn and Weld anchorage; Benmore mountain; Waiau-toa or Big river; Kaikora peninsula; coasting anchorages - - - - - - - - 235, 236

Page
Kaikora and Looker-on mountains; Ingles bay and anchorage; southerly currents; Gooch bay and anchorage; Amuri bluff; Waiau-ua river; Gore bay and anchorage; Hurunui river; Sail rock 236–242
Table island; Pegasus bay; Double corner; Avon or Opawaha river 242–244
Soundings, tides, currents, and general remarks on the coast between cape Campbell and Banks peninsula 244
Banks peninsula; general description; soundings off, harbours; port Lyttelton or Victoria and light 244–249
Port Levy and Pigeon bay; Akaloa bay; Sail rocks 249–251
Bone bay; Akaroa harbour 251–253
Coast from Akaroa harbour to the westward; Ninety-miles beach; Waihora lake 253, 254
Timaru with directions, light; Waitangi river; Oamaru anchorage; coast southward; Moerangi bay 254–258
Whalers' home point; Fish and Danger reefs; Waikouaiti and Blueskin bays; soundings off coast 258–260
Otago harbour and its approach; bar; North channel; anchorage outside; directions for entering; Driver rock; tides; buoys; signals; lighthouse and other lights 260–265
Coast from Otago to Nugget point; lights; Molyneux bay and anchorage; Matau or Clutha river; current; soundings; coast from Nugget point to Foveaux strait; Catlin river 266–268
Long point; Tautuku bay; Chaslands mistake; Brothers point; Waikawa river; Waipapapa point; exposed coast and irregular tides; Mataura river; general remarks 268–270

CHAPTER VIII.

FOVEAUX STRAIT, AND SOUTH OR STEWART ISLAND, INCLUDING THE TRAPS ROCKS, AND SNARES ISLANDS.

Foveaux strait, general description of, and difficulties of navigation 271–273
Solander island 272
Ruapuke island and anchorage; Green island; Seal and Toby rocks; Fairchild shoal 273–275
Breaksea islands; Kelly rock; outlying islets and dangers off Ruapuke island; Henrietta bay; Caroline bay; eastern entrance of Foveaux strait; tides 275–278
Prevailing winds in Foveaux strait 278, 279
Bluff hill, view from; Bluff harbour with directions; Dog island and light 279–283
New river; Invercargill 284, 285
Coast westward of New river; Jacob's river; Howell roads 286

Page
Dangers on north side of Foveaux strait; Centre island, light; Fish and Escape reefs; Pig island; Half-way and Doubtful rocks; caution necessary in navigating - - - - - - - 286, 287
Tewaewae bay and Mid-bay reef; coast from Tewaewae bay to Puysegur point; Green islets; Patupo or Big river, Price's boat harbour, Windsor point, Marshals rock - - - - - - - - 287, 288

SOUTH OR STEWART ISLAND.

General description of - - - - - - - 288, 289
Saddle point; Murray river and roadstead - - - - 289, 290
Anchorage on east side of Stewart island; Gull and Newton rocks; port William - - - - - - - - - 290, 291
Group of islands and rocks adjacent to port William and Paterson inlet; Fish rock; Horse-shoe and Half-moon bays; Paterson inlet, with its anchorages - - - - - - - - - 291–293
Port Adventure - - - - - - - - - 294
Weka and Wreck reefs; Breaksea islands - - - - 294, 295
Bruce reef; Lords river; port Pegasus, with its anchorages - - 295–297
Wilson bay; Traps rocks; Group of islands off the S.W. side of Stewart island - - - - - - - - - 297, 298
Port Easy; Mason bay, and adjacent dangers - - - - 298, 299
Codfish island, and anchorage in Sealers bay; Rugged islands; Cave point; White rocks; Black rock point; tides on the coast of Stewart island - - - - - - - - - - 299, 300
SNARES ISLANDS - - - - - - - 300–302

CHAPTER IX.

WEST COAST OF THE MIDDLE ISLAND, FROM THE WESTERN ENTRANCE OF FOVEAUX STRAIT TO CAPE FAREWELL.

General description of west coast - - - - - 303–305
Preservation inlet, approach to; Balleny reef; Table rock - - 306
Welcome road; Sunken reef; anchorage in Cuttle cove; Cording islets - 307, 308
Steep-to island, anchorage for small vessels; Isthmus sound; Useless bay - - - - - - - - - - 308, 309
Revolver bay; Long sound; South entrance of Preservation inlet, directions for entering; tides - - - - - - - 309, 310
Chalky or Dark Cloud inlet, eastern and western passages; Sunk rock; Landing bay; South port; North port; Edwardson and Cunaris sounds; Small-craft harbour islets; West cape - - - 310–314
Dusky sound or bay; Anchor island and anchorage, with directions for 314, 315

	Page
Directions for entering Dusky sound from the southward; Pickersgill *harbour, directions for*	315, 316
Cascade cove; directions for sailing up Dusky sound	316, 317
Facile harbour, directions for entering; Cormorant and Goose coves; *Duck cove, directions* for entering; H.M.S. *Acheron's* anchorage	317, 318
Arm *connecting* Dusky and Breaksea sounds; temporary anchorages; *water east of* Resolution island; Breaksea sound, north and south *channels; best anchorage*	319–321
Daggs sound, 4-fathom bank in mid-channel	321, 322
Doubtful inlet, with its anchorages	322–324
Thompson sound; H.M.S. *Acheron's* anchorage in Deas cove	324, 325
Nancy sound, anchorage in Heel cove; Charles sound; Caswell sound *and anchorages*	325–327
George sound and anchorage; Two Thumb and Looking-glass bays	327, 328
Bligh sound, difficult of access to sailing vessels; Clio rock; Milford *sound, remarkable features*; Brig rock; anchorage in Anita bay and *at head of Milford sound*	328–330
Coast northward of Milford sound; Martin bay; Cascade point; Jack*son bay, native supplies*, anchorage; coast N.E. of Jackson bay	331–333
Open bay islets and anchorage; Great Southern Alps; mount Cook	333, 334
Coast from Arnott point to Abut head	334
Bruce bay; Okarito lagoon; coast from Abut head to the N.E.; Cliffy *head; Wanganui river*; Bold head; Hokitika river; Teremakau *river; Grey or* Mawhera *river*; Matungi-tawau point; point Perpen*dicular; Five Fingers rocks*	335–340
Cape Foulwind and light, anchorage under with southerly winds; *Steeples rocks*	340, 341
Coast from cape Foulwind to Rocks point; Falcon rock; Buller or *Kawatiri river* with directions; Wanganui river	341–343
Heaphy or Wakapoai *river*; Rocks point; Kiourangi point, remarkable *landslip, a good* sea-mark; *Stewart* breaker; Wanganui inlet	343, 344
Cape Farewell, appearance from the southward; Curious cliff; Farewell *spit; tides*	344, 345

CHAPTER X.

WINDS, WEATHER, AND METEOROLOGY.

General remarks	346
North island, East coast	347–349
Cook strait, and Wind register	349–351
North island, West coast	352, 353
Middle island, East coast	353–356
Foveaux strait, and South island	356, 357
Middle island, West coast; Rainfall and temperature tables	357–359

CHAPTER XI.

AUCKLAND, CAMPBELL, ANTIPODES, BOUNTY, AND CHATHAM ISLANDS.

Page
General description of Auckland islands - - - - 360–364
Bristow rock; North-west cape; West coast; port Ross or Sarah's bosom harbour - - - - - - - - 364–366
Enderby island; Terror and Erebus coves; Laurie harbour; tides - 366–368
Ocean and Ewing islands; Dundas and Green islets; Carnley harbour; Musgrave inlet; Smith harbour - - - - - - 368–370
Campbell island; Perseverance harbour; tides; general description - 370–373
Antipodes islands - - - - - - - 373, 374
Bounty islands - - - - - - - - - 374, 375
Chatham islands, general description - - - - - 376–381
Anchorage; mount Patterson; Rangi-tutahi or Sisters islands; North-west reef; Cuba channel; Petre bay; port Hutt, tides - - 381–384
Port Waitangi; Pitt island and strait; Star Keys group; Eastern reef; Bertier rock - - - - - - - - 384–386
Macquarie island, Bishop and clerk, Judge and clerk - - - 386, 387
Emerald island - - - - - - - - - 387

TABLE OF POSITIONS - - - - - - - 388–394
MAGNETIC OBSERVATIONS - - - - - - 395, 396

IN THIS WORK THE BEARINGS ARE ALL MAGNETIC,
EXCEPT WHERE MARKED AS TRUE.

THE DISTANCES ARE EXPRESSED IN SEA MILES OF
60 TO A DEGREE OF LATITUDE.

A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO
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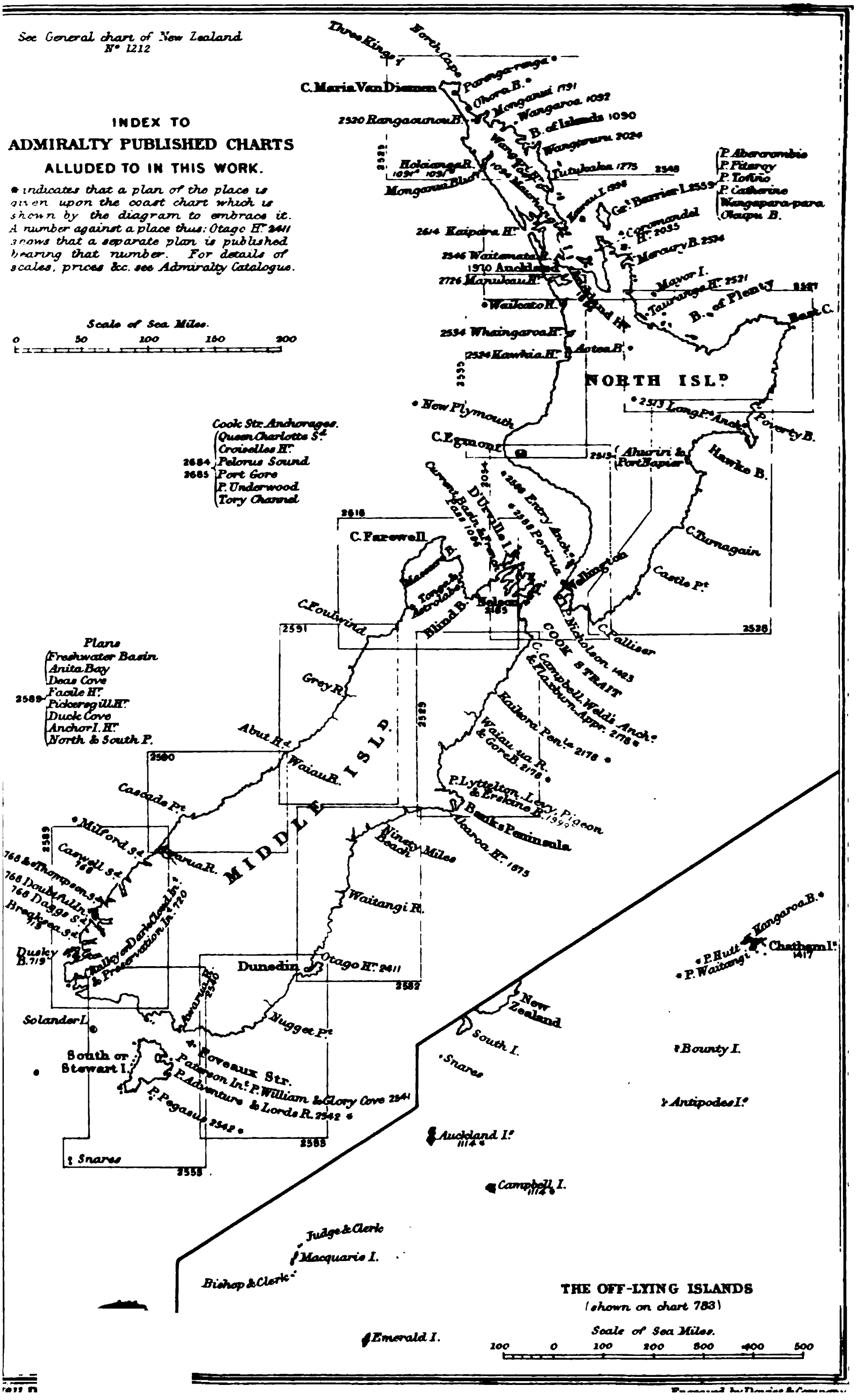

See General chart of New Zealand N° 1212

INDEX TO
ADMIRALTY PUBLISHED CHARTS
ALLUDED TO IN THIS WORK.

• indicates that a plan of the place is given upon the coast chart which is shown by the diagram to embrace it. A number against a place thus: Otago H^r 2411 shows that a separate plan is published bearing that number. For details of scales, prices &c. see Admiralty Catalogue.

NEW ZEALAND PILOT.

INTRODUCTION.

The islands of New Zealand were discovered by the Dutch navigator Abel Tasman, in the year 1642; he remained there but a very short time, and little was known of their character and extent until the return of Captain Cook from his first voyage in 1769; during this and his two subsequent voyages, he explored and partially surveyed their general outline.*

Later navigators, both French and English, have added to our geographical knowledge of their form and position; and since the close of the last century whalers and sealers have resorted to their harbours in order to refit their vessels, to traffic with the natives, and to procure wood and water.

The Church Missionary Society, to whose untiring zeal Great Britain is chiefly indebted for the early civilization of the natives of these islands, began its labours among them in the year 1814; a quarter of a century later, namely, in 1840, the three islands of New Zealand were proclaimed a British colony, under the names of New Munster, New Ulster, and New Leinster; the seat of government being established at Auckland, in the Hauraki gulf.

As these names, however, have not come into general use, the islands will always be called in the following pages the North, the Middle, and the South, or Stewart Island, the names by which they are best known among the inhabitants, and most familiar to the seaman.

They lie between the parallels of 34½° and 47½° south latitude, and the meridians of 166½° and 178¾° east longitude; the North and Middle islands are by far the largest; they occupy nearly the same space, and are separated from each other by Cook strait; their extent of coast line taken together amounts to nearly 3,000 miles. The area of the country is estimated at 102,000 square miles, two-thirds of which are fitted for agriculture and grazing; the South or Stewart island is comparatively inconsiderable in extent; it has always, however, been classed as one of the principal islands, and possibly the number and excellence of its harbours may entitle it to this distinction, although its circumference does not exceed 120 miles; it is separated from the Middle island by Foveaux strait.

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* *See* Admiralty chart of New Zealand, No. 1,212, from the surveys of H.M. ships *Acheron* and *Pandora*, 1848–55; scale, *degree* = 2·4 inches.

NORTH ISLAND.[*]—The geological structure is chiefly volcanic, and traces of recent volcanic action are to be seen in many parts; it is mountainous and well wooded, particularly in the northern districts; among the trees are the kauri, the red and white pine, and many others suitable for ship-building purposes; the kauri is confined to the north, and is seldom found far to the southward of the parallel of Auckland.

The sea worn or peninsulated coast features of the northern portion of this island are very remarkable, for instance, the waters of Manukau harbour, on the western side, and those of Waitemata river,—or Auckland harbour,—on the eastern, meet within a mile.

The North island embraces an extent of coast amounting to nearly 1,500 miles; its harbours cannot be said to be numerous, nor are they by any means equally distributed; by far the greater number are included between the North cape and cape Colville,—the east point of Hauraki gulf,— a distance of only 200 miles; while from cape Colville to the East cape, another distance of 200 miles, there are only the two anchorages, Mercury bay and Tauranga harbour, both difficult of access, and the former unfit for vessels of large burthen. Again, from the East cape to port Nicholson, a distance of about 350 miles, the coast offers no secure harbour, but merely occasional anchorages, with off-shore winds.

The harbours on the west coast of the North island have all shifting sand bars at their entrances.

Proceeding northward from port Nicholson, is the small bar harbour of Porirua, and also anchorages on the east side of Mana and Kapiti islands; between Kapiti and New Plymouth (*Taranaki*) are the Manawatu, Rangitiki, and Wanganui rivers, navigable for small vessels; as also several smaller streams fit only for boats; they have all bars at their entrances.

New Plymouth, 160 miles from port Nicholson, is an open roadstead exposed to winds between N.E. and W.S.W.; northward is the river Mokau, the harbours of Kawhia, Whaingaroa, and Aotea, with the Waikato river, fit only for vessels of small tonnage. The remaining and principal ports on the west coast are Manukau, Kaipara, and Hokianga; they are spacious and magnificent harbours when once inside; and with the excellent surveys that have been now made, and due caution, their bars may be passed with safety.

Such is a general summary of the harbours of the North island, and the manner in which they are distributed; a detailed description, with directions for their navigation, will be given in its proper place.

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[*] Native name, *Te ahi a maui.*

MIDDLE ISLAND.[*]—The Middle, like the North island, is chiefly of volcanic formation, but it contains a far greater extent of plain and open country, the eastern and southern portions being to a great extent available for grazing or agricultural purposes; a range of high and rugged mountains, not inaptly termed the backbone of the island, extends from cape Farewell, the north-west extreme, through the whole length of the island to the south-west extreme, approaching occasionally within a few miles of the coast, varying in height from 3,000 to 7,000 feet, and attaining between the parallels of 43° and 44° S., an elevation of 12,349 feet. This latter magnificent mountain has received the name of the illustrious navigator Cook, who first sailed along this part of the coast.

The observation with regard to the number and distribution of the harbours in the North island applies in like manner to those in the Middle island.

The north side from cape Farewell to cape Campbell is indented with numerous deep and extensive sounds and harbours, where excellent anchorages may be obtained with little difficulty; while along the whole of the eastern coast, from cape Campbell to Bluff harbour, an extent of nearly 500 miles, the harbours of Akaroa and port Lyttelton or Victoria, in Banks peninsula, and Otago,—a bar harbour, though not difficult of access,—are the only ports which offer shelter to the mariner.

The harbours on the south side are, the Bluff (*Awarua*) and New river, the former available for vessels of large tonnage, though it has a narrow entrance, with strong tides; New river is navigable for vessels drawing 14 feet, but it is necessary to be acquainted with the locality to enter with safety; both these harbours are admirably situated in connexion with the extensive tracts of grazing country, which extend from them nearly 100 miles inland:—the ports of Stewart island are also exceedingly convenient and safe, should bad weather prevent a vessel entering Bluff harbour or New river.

From the south-west extreme to Milford haven on the west coast, a distance of 120 miles, nature has been most bountiful but capricious in her provision of harbours, there being no less than thirteen deep inlets or sounds, some running inland a distance of 20 miles; they are, however, more picturesque than useful, surrounded by high and precipitous mountains, rising almost perpendicularly from the water's edge to an elevation of from 3,000 to 5,000 feet, and clothed nearly to their summits with impenetrable forests; their depths generally exceed a hundred fathoms, and anchorage can rarely be obtained except at the very head of some remote cove, where the water often shoals suddenly from 50 to 5 fathoms.

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[*] Native name, *Te wai pounamu.*

The appearance of this iron-bound coast, cleft asunder as it were into harbours by some awful convulsion of nature, presents a scene truly grand and solitary;—no inhabitants but the tenants of the forest, the *ka-ka-po*[*] and *kiwi*[†], rare and remarkable birds known in no other country; and no single spot of level land. The mariner has little inducement to seek an anchorage here, unless it be the whaler who would take refuge from the coming gale when he has not sufficient room to keep the sea, or the sealer in the legitimate pursuit of his calling.

Fifty miles northward of Milford haven is Jackson bay, where there is anchorage with off-shore winds; there is some cultivation here, and whalers occasionally touch for the sake of the precarious refreshments which the few and scattered natives are able to supply.

From Jackson bay to cape Farewell, a distance of 300 miles, is an open and exposed coast, except the small inlet of Wanganui, a bar harbour, 10 miles south-west of the latter cape, and eligible for vessels of 10 or 12 feet draught in fine weather; to which may be added Buller river, Grey river, Teremakau river, Hokitika, Okarito, Bruce bay, Taumaka, and Martin bay, places that have come into notice as outlets for the traffic caused by the goldfields, and the large tracts of grazing country in their neighbourhood.

SOUTH, or STEWART ISLAND,[‡] as has been observed, is small in extent, being only 120 miles in circumference; it is mountainous and well wooded, has several excellent harbours on its eastern side, as well as some anchorages on its western; but from the prevailing westerly winds there is always a swell on that side, and the latter should only be considered as stopping places.

This island is the resort of many whaling vessels, colonial and foreign; wood and water can be procured with little trouble, and refreshments, such as they require, obtained from the settlers. It is becoming of considerable importance from its proximity to the extensive grazing country of the southern districts of the Middle island, in consequence of the scarcity of good anchorages on that part of the coast.

Although it does not come within the scope of a work of this kind to enter into the political or statistical details of a country, the hydrography and navigation of which alone it professes to describe, yet a few brief remarks on the different settlements of a colony comparatively so little known as New Zealand may possibly prove useful to the seaman, and not be considered irrelevant.

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[*] *Nestor*, a remarkable genus of nocturnal parrot, of which but two species are known, one of these (*N. hypopolius*) is restricted to New Zealand, the other (*N. productus*) to Philip island, a mere rock near Norfolk island, but now considered to be extinct.

[†] *Apteryx.*—This genus comprises three known species, all restricted to New Zealand.

[‡] Native name, *Rakiura.*

NEW ZEALAND is divided into nine provinces, viz., Auckland, Taranaki, Hawke bay, and Wellington (the capital) in the North island; Nelson, Marlborough, Canterbury, Otago with Southland, and Westland, in the Middle island. There are 21 ports where resident magistrates and customs officers are established, viz., Akaroa, Auckland, Chatham island, Dunedin, Greymouth, Havelock, Hokitika, Invercargill, Lyttelton, Napier, Nelson, New Plymouth, Okarito, Onehunga, Tauranga, Timaru, Wanganui, Wangari, Wellington, Westport.* The government of the whole colony is vested in a governor appointed by the crown; and a general assembly, consisting of two houses, one elected by the people, the other appointed by the crown for life. The islands were created into a diocese in 1841.†

The commerce of New Zealand increased more than twenty fold in the twenty years from 1852 to 1871. The imports, which were of the value of 359,444*l.* in 1852, amounted to 4,078,193*l.* in 1871, and to 8,373,233*l.* in 1879; and the exports, valued at 145,972*l.* in 1852, amounted to 5,171,104*l.* in 1871, and to 5,742,916*l.* in 1879.

The staple article of export to the United Kingdom is wool, the value of which amounted to 1,354,152*l.* in 1866, in 1871 to 1,606,144*l.*, and in 1877 to 3,658,938*l.* The British imports comprise mainly textile fabrics and iron, the latter of the value of 134,013*l.* in 1871.

Shipbuilding and the trade in timber are, next to wool growing, the chief elements of the industry of New Zealand.

Among the mineral productions are gold, copper, iron, and coal.

AUCKLAND.—The town of Auckland, formerly the capital and seat of Government, stands on the narrow neck of land which separates the eastern from the western coasts, being built on the south bank of the Waitemata river, an arm of the Hauraki gulf, and one of the most secure harbours in New Zealand; its position in a commercial point of view appears to be most favourable, having water communication from both sides of the island—on the eastern, by the Hauraki gulf, and on the western by the harbour of Manukau, the waters of which flow within half a mile of an arm of the Hauraki gulf, two miles eastward of Auckland harbour. The amount of agricultural land in the neighbourhood is also considerable; and the natural facilities for inland communication when developed are great; thus to the north, the Kaipara and Wairoa rivers lead through the kauri

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* From New Zealand Almanac, 1874.

† In addition to the Metropolitan, there were in 1864 the four sees of Christchurch, Nelson, Wellington, and Waiapu. The total European population by the last census, March 1878, was 414,216, of which 158,208 were resident in the North island and 256,008 in the Middle island.

[illegible] almost to the Bay of Islands—and to the south, the Waikato and Thames rivers into the heart of the island.

This province, the most northern and extensive in the North island, extends from the North cape to the parallel of 39° S. on the east coast, and the Mokau river on the west coast; and contains within itself almost all those natural productions which determine the particular industries of nations, and which are usually only found in widely distant countries, as timber, kauri gum, flax, coal, limestone, marble, gold, copper, iron, silver, chrome, lead, antimony, zinc, cadmium, plumbago, soap-stone, mica, asbestos, sulphur, alum, manganese and other minerals, many medicinal springs, and a mild healthy climate. Gold has been found on both sides of the range running from cape Colville to the Aroha mountains, distant about 100 miles. Gold has also been found at North cape, Bay of islands, Wairoa near Howick, at Manukau near Drury, at Rangiriri, and other places. Copper at Coromandel, Kawau, Great Barrier island, Upper Waikato, &c. Lead at Coromandel and Great Barrier island. Tin at Shortland and in Taupo district. Arsenic at Coromandel and Great Barrier island. Manganese at Waiheki and Pahiki. Iron on the west coast. Mercury and antimony have been found at Shortland, and quicksilver at the Bay of islands.

The freehold holdings of land in Auckland province amounted in 1871 to 850,363 acres, leasehold, 586,474 acres, Crown lands rented for pastoral purposes, 97,922 acres.

In 1870 there belonged to the port of Auckland 184 vessels, of 9,177 tonnage.

The total imports for the province for 1879, are given at 1,526,425*l.*; exports, 622,597*l.*

Auckland, established in 1840, has made rapid progress; it is now a commercial town of importance, presenting an aspect of comfort and substantial prosperity, and is the emporium of the bulk of the trade with the natives; the coasting trade also is of considerable extent. The number of European inhabitants in the town and province, by the census return of December 1861, was 24,420; by that of 1878 it had increased to 84,200, the population of the town of Auckland including suburbs being 29,360. The area of the town is 631 acres. The principal streets, all lighted with gas, are built with continuous ranges of fine buildings. The manufacturing industries are numerous, such as ship and boat building, engineering, and iron foundries, the manufacture of glass, rope, twine, tiles, earthenware, doors, sashes, leather, pickles, sauces, jams, ale, whiskey, baskets, biscuits, blacking, bricks, soap, candles, carriages, carts, pottery, &c.

A railway runs to the southward a distance of 98 miles, opening a fine country, and to the northward sections of 16 and 7 miles are open; a section to connect Auckland with the northern ports is under construction.

TARANAKI, formerly known as New Plymouth (which latter name, by an act of the colonial legislature, was retained for the town only), is one of the earliest settlements, and was colonized in 1841 by emigrants principally from the counties of Devon and Cornwall; it is situated on the south-west coast of the north island, 14 miles northward of the noble mount Egmont, and although the smallest, is considered the most fertile district in New Zealand. It is essentially an agricultural settlement, and all kinds of produce flourish in the greatest luxuriance; corn is grown to a large extent, ground by water mills, and exported principally to Wellington and the other settlements. The drawback to the advance of Taranaki is the want of a harbour; the roadstead, however, is safe in moderate weather, and with the establishment of large boats, organized under the direction of a beach-master, vessels load and discharge cargoes with facility and rapidity. The construction of a breakwater has lately been proposed.* The climate of Taranaki is generally considered to be one of the finest in New Zealand. The native disturbances of 1860–61, and again in 1863, have seriously interrupted the progress of the settlers in this province, and until peaceful relations have been restored, its prosperity will be retarded. By the census return of December 1861 the number of the European inhabitants in New Plymouth and the districts was 2,044; while that of 1878 shows 9,640, of which 2,680 formed the population of New Plymouth. Imports in 1879, amounted to 32,230*l.*

Freehold holdings in Taranaki province amounted in 1871 to 57,587 acres; leasehold, 20,732 acres; crown land rented for pastoral purposes, 361 acres.

HAWKE BAY.—This province, originally forming part of Wellington, and known also by the native name of Ahuriri, was erected into a separate province on the 1st November 1858. It is situated between Auckland and Wellington on the east coast, and has an extensive tract of country. In size, compactness of form, climate, and centrality of position between the two great provinces of Auckland and Wellington, Hawke bay bears a general resemblance to Taranaki. A large proportion of the district is composed of land of great natural fertility, well suited for agricultural and pastoral purposes, and also contains an unlimited supply of some of the most valuable timber in New Zealand. It has a small harbour (port Napier), the town of which is the capital of the province. The European population in 1861 numbered 2,611; in 1878, 15,300, of which 8,376 were inhabitants of port Napier.

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* An artificial harbour is in process of construction.—1880.

A railway extends 65 miles to the southward, forming part of the main trunk to Wellington.

Freehold holdings in Hawke bay province amounted in 1871 to 833,460 acres; leasehold, 402,557 acres; crown land, rented for pastoral purposes, 570,753 acres. In 1870 the number of vessels belonging to port Napier was 9 of 501 tonnage.

The imports for 1879 were 168,561*l.*; and exports 370,362*l.*

WELLINGTON, founded in 1839 by the New Zealand Company, was the first regular settlement; occupying the central position it does on the north shores of Cook strait, with an excellent and spacious harbour (port Nicholson), within easy distance of the southern settlements, and adjoining extensive pastoral and agricultural districts; it possesses great advantages, is the commercial depôt of a wide extent of country, and now the seat of government.

In the number and tonnage of the shipping which visit its port, Wellington may vie with Auckland, and it likewise enjoys a large and increasing coasting trade; the European population in the province, from the census return of December 1861, was 12,566; by that of 1878 it was 52,600, of which 18,953 comprised the population of the town of Wellington.

The southern provinces, and Wellington in particular, appear to be subject to severe and not unfrequent shocks of earthquakes; the first experienced by the colonists occurred in October 1848, and caused much damage to the more substantial buildings in Wellington; the last, in January 1855, though equally if not more severe in character, was not attended with so much destruction of property; happily there was but a very small loss of life on either occasion.*

Freehold holdings in the province of Wellington amounted in 1871 to 822,692 acres, leasehold 330,108 acres; crown land rented for pastoral purposes 123,879 acres.

The number of vessels belonging to the port of Wellington in 1870 was 26, of 3,285 tonnage.

The imports for the district in 1879 were 1,598,026*l.*, and the exports 838,901*l.*

NELSON, also originally a New Zealand Company's settlement, was established at the head of Blind bay in 1841. It has more an agricultural and pastoral character than either Auckland or Wellington, and though not possessing the advantage of a spacious port, its haven affords secure anchorage to vessels of large tonnage.

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* Whether these earthquakes cause any change in the hydrographic features of the localities of greatest action, future surveys can alone determine; the shoal flat in Lambton harbour, fronting the town of Wellington, rose 2 feet in the earthquake of 1855.

A large proportion of the province of Nelson is mountainous, rugged, and unfit for agriculture, though its ranges contain gold, silver, iron, copper, lead, &c., which are its chief sources of wealth. Coal of an excellent description is also obtained in this province.

The Waimea plain, in the immediate vicinity of Nelson, affords about 50,000 acres of level land, a greater portion of which is adapted for agricultural purposes. Collingwood, a rising township, is placed in Massacre bay, and has been constituted a port of Entry; it is near the gold fields of Aorere.

The climate of Nelson is superior probably to any other portion of New Zealand, being singularly free from the strong winds, otherwise so common. Shocks of earthquakes have been experienced, but more subdued in character than those felt on the opposite side of Cook strait. The population of the town and surrounding districts was, by the census return of December 1861, 9,952; that of 1878 gave 25,630.

Freehold holdings in Nelson province amounted in 1871 to 640,218 acres, leasehold 159,350 acres, and crown land holdings 384,021 acres.

The shipping belonging to the port of Nelson amounted to a tonnage of 4,062, numbering 61 vessels.

The imports for 1879 were 273,653*l.*; exports, 70,157*l.*

MARLBOROUGH, formerly a portion of Nelson, is a tract of country on the north-east coast of the Middle island; it comprises the valley of Wairau. This district contains about 250,000 acres of land suitable for agricultural and grazing purposes, and is now fully occupied for the depasturage of extensive flocks. Wairau river, which runs through this valley and discharges itself into Cloudy bay, offers facilities for the shipment of wool and other produce from the plains; it is navigable for several miles for large cargo boats, and is in close proximity to the excellent harbour, port Underwood. The capital of the province is Blenheim, the other towns Picton and Havelock are placed at the head of Queen Charlotte and Pelorus sounds, the natural outlets of the inland district. Blenheim and Picton are connected by rail, the latter being the port of call for steamers. Gold, coal, and antimony have been found in this district. The climate is very equable. The imports in 1879 were 11,848*l.* By the census return of December 1861, the European inhabitants numbered 2,299, by that of 1878, 7,700, out of which the town of Picton numbered about 3,000.

In the province of Marlborough the holdings amounted in 1871 to freehold 645,364 acres, leasehold 68,415 acres, rented crown land for pastoral purposes 904,225 acres.

CANTERBURY was organized on special church principles, the body of colonists arrived in 1860. The agents of the Colonizing Association were employed for some time previously in surveying the country, and in the construction of roads, wharfs, and accommodation; from these circumstances, and the fact of several thousand emigrants having been landed almost at the same time on the field of their labours, together with the natural advantages of its position, as also other causes, gave it almost immediately a comparative position with the earliest of the settlements, and cannot fail to make it hereafter an important province in New Zealand.

The site of the principal town, Christchurch, with a population of 24,976 (1878), is on the plain a few miles from the sea coast, immediately northward of Banks peninsula.

This great plain, extending westward half way across the island, and bordering on the grazing lands of the Nelson and Marlborough provinces to the north, and on those of Otago to the south, contains upwards of 2,000,000 acres of grass country, a large proportion of it being considered excellent agricultural land. It has several considerable streams running through it, discharging their waters into Pegasus bay, and by the Ninety miles beach: closely adjoining Banks peninsula is the Avon or Opawaha river, on a branch of which Christchurch is built, which enters the sea a few miles to the northward of port Lyttelton heads, and formerly, was the only access, between Lyttelton and Christchurch, for goods by coasters and small steamers, but the bar, near Sumner, is at times difficult to attempt.

The area of land under cultivation, and in use for grazing purposes, in 1871, in the province of Canterbury amounted to 5,662,375 acres; of this 557,185 acres were freehold, there were also 364,418 acres leased for other purposes. This district has rapidly increased in prosperity, its facilities for transport being naturally easy; its railroads now run from north to south, and extend in radiating branches through all the chief agricultural areas. The journey from Christchurch, through Canterbury and Otago, to the extreme southern point of the island can be made by rail.

The population of the plains in 1857 was 6,712, and by the census return of December 1861, 16,040, while the return of 1878 showed 91,922.

The imports in 1879 amounted to 1,697,843*l*., and the exports to 1,380,230*l*. In 1881 the latter reached to 1,539,088*l*., whilst in 1871 the amount was only 587,082*l*.

Lyttelton, the seaport town of Canterbury (with a population in 1878 of 3,476), is built on the north shore of port Lyttelton or Victoria,* on the north-west side of Banks peninsula, and is connected with Christchurch by rail (the first in New Zealand), over which the exports of the greater part of the district are conveyed to the port, and supplies therefrom to the interior. This port is easy of access to vessels of any burden, and notwithstanding its being partly open to the eastward, and subject to an occasional swell, it is considered a fairly good anchorage.* The port of Lyttelton owned in 1870, 61 vessels, of 4,062 tonnage. In 1862 the first electric telegraph in New Zealand was opened between Christchurch and Lyttelton.

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* Formerly known as port Cooper.

OTAGO province including Southland, once an independent province but re-united to Otago since 1870, is the southern portion of the Middle island, and is now the most populous of the provincial districts. Otago, 150 miles southward of Banks peninsula, was founded in 1847 by a body of Scotch colonists in connection with the free church. The harbour, though it has a bar entrance, is generally accessible, and good when inside; the climate is bracing and healthy, and the grazing and agricultural capabilities of the adjoining country are highly spoken of. The discovery of gold in 1861 in various localities has, by the great influx of population, rapidly developed the resources of this province, which, in addition to its gold fields, is said to be rich in other minerals. The chief town, Dunedin, is at the head of a sheet of water extending 11 miles from the entrance of the harbour, in a south-westerly direction: ships of large burden proceed 6 miles up to Koputai bay, off the small port town, Chalmers, now called the "port of Dunedin," between which and Dunedin there is constant communication by rail. Since the discovery of gold, Dunedin has greatly increased in population and resources.

The extent of cultivated and grazing land in the province of Otago, in 1871, was 6,099,921 acres, rented from the Crown; freehold 729,427 acres; leasehold, including crown land, 301,362 acres.

The shipping of the port of Dunedin consisted, in 1870, of 71 vessels, of 8,184 tonnage.

Southland, at the extreme south end of the Middle island, is a county of Otago, and subject to its own land laws, and extends from the Mataura river on the east, to the Waiau river on the west, its northern boundary stretching nearly to the gold-fields adjoining lake Wakatip; it has some fine plains. Invercargill, the chief town, with a population of 3,760 in 1878, is situated on New river, and has already made good progress; it is the outlet of an extensive pastoral district; Bluff harbour is the port of discharge for large vessels and connected with Invescargill by rail, the distance being 20 miles.

The extent of land comprised under the head of freehold holdings in Southland in 1871, was 500,576 acres; leasehold, 73,350 acres; crown land rented for pastoral purposes, 1,437,188 acres.

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* An artificial harbour has been formed at Lyttelton by the construction of Moles extending from Officer and Naval points.

In 1879 the port of Invercargill owned 7 vessels of 189 tonnage.

Otago province numbered 4,631 settlers in 1857, and by the census taken of December 1861, the population was 27,163, and now far exceeds these numbers, having amounted in 1371 to 69,491, and in 1878 to 114,469, of which Dunedin numbered 22,190, and port Chalmers about 5,000.

In 1879 the total imports were 2,896,885*l.*, and the exports 2,016,812*l.*

WESTLAND province, as its name implies, lies on the western side of the Middle island, and extends from Grey river on the north to Awarua on the south. It contains over 3,000,000 acres of land, the greater part of which is forest, producing timber in illimitable quantities. The district abounds with gold and other minerals. In 1878 it had a population of 16,912, of which Hokitika, the capital, numbered 8,975.

Its chief ports are Hokitika, the head-quarters of the gold-fields; and Greymouth, its port for coal.

Gold Exports.—The following table shows the quantities and value of gold exported from the several provinces containing gold-fields, from 1st April 1857, to end of December 1870, and also to the end of December 1871.

Gold Fields of	Exports previous to December 31st, 1870.		Total Exports from April 1st, 1857, to December 31st, 1871.	
	Quantity.	Value.	Quantity.	Value.
	Oz.	£	Oz.	£
Province Auckland - -	299,023	1,005,288	629,349	2,198,946
„ Marlborough -	36,682	141,530	38,549	148,998
„ Wellington -	30	120	30	120
County Westland - -	1,476,453	5,812,187	1,609,365	6,343,835
Prov. Nelson - -	1,016,520	4,018,404	1,126,504	4,458,340
„ Otago - · -	2,684,755	10,471,744	2,839,695	11,091,514
„ Southland - -	29,386	116,246	29,386	116,246
Total - ·	5,542,849	21,565,479	6,272,878	24,352,999

Whilst for the whole period ending 31st December 1877, the statistical summary of gold exported from the Colony,—as stated by Sir Julius Vogel, K.C.M.G., Agent-General for New Zealand,—amounted to 8,640,664 oz., the value being 33,732,594*l.*

Natives.—With regard to the native population of New Zealand it is not easy to arrive at an exact calculation of their numbers, as no complete census has yet been taken, 1864.* From various estimates made by those best qualified to judge, and who expended much trouble to arrive at the truth, it appears that in the year 1850 their number did not exceed

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* By official returns it appears that, at the beginning of 1868, there were in the North island 37,107, in the Middle island 1,433, or a total of 38,540 Maories in the whole colony. According to accounts the Maories are declining in numbers from year to

70,000. Of these, about 67,000 occupied the North island, a large proportion being distributed over the northern part, and between the bay of Plenty and Poverty, with Hawke, bay on the east coast. In the Middle island the proportion was very small, being not more than 2,600, and those greatly dispersed.

In 1840 the native population was estimated at 120,000, thus making a decrease of 4 per cent. per annum for the ten years. This decrease agrees with the calculations that were made on a small scale in and about Wellington from 1847 to 1850. The character of this interesting race is undergoing great change. Cook's account is invaluable as a record of their habits and manners as a heathen nation. They are now becoming a Christian people, with a keen appreciation of the benefits resulting from the arts of peace; they have generally learned to read and write, to cultivate wheat and European fruits, and to sedulously attend places of divine worship and schools; indeed, at the present time European customs, clothes, houses, and food are being adopted by them not only near the settlements, but through the islands.

The following is an account of the number of emigrants sent from England by the Agent-General of Emigration for three months, ending 31st December 1873: Wellington, 971 souls; Auckland, 387; Otago, 1,157; Canterbury, 1,312; Hawke bay, 491.

Shipping.—The numbers and tonnage of vessels entered inwards and cleared outwards at the several ports of New Zealand during the year 1870 were as follows:—The total inwards was 756 vessels, of 273,151 tonnage, being a decrease, as compared with 1869, of 8 in the number of vessels, but an increase of 22,420 in tonnage. The total outwards was 766 vessels, of 265,407 tonnage, being a decrease, as compared with 1869, of 5 in the number of vessels, but an increase of 17,643 in tonnage.

Of the 756 vessels inwards, 145, of 85,643 tonnage, were British; 553, of 167,869 tonnage, colonial; 45, of 15,361 tonnage, American; 4, of 569 tonnage, German; 3, of 427 tonnage, French; 2, of 1,025 tonnage, Norwegian; one, of 1,000 tonnage, Russian; one, of 536 tonnage, Swedish; one, of 385 tonnage, Hawaiian; and one, of 336 tonnage, Dutch. Of the 766 vessels outwards, 133, of 78,197 tonnage, were British; 574, of 166,812 tonnage, colonial; 44, of 15,115 tonnage, American; 5, of 2,228 tonnage, Norwegian; 3, of 568 tonnage, German; 3, of 427 tonnage, French; 2, of

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year; by returns between the years 1858 and 1868 there was a decrease of 30 per cent. of the total native population. The census of 1872 gave a total of 36,359.

Sir Julius Vogel, in a paper read at the Royal Colonial Institute, London, the 19th March 1878, states the population, by the census taken in 1874, to be for the North island—Males, 23,649; females, 19,769; or a total of 43,418,—and the Middle island about 3,600.

673 tonnage, Dutch; one, of 1,000 tonnage, Russian; and one, of 387 tonnage, Hawaiian.

The number and tonnage of vessels entered inwards during the year 1876 were as follows: 878 vessels, with a tonnage of 393,180, being an increase, as compared with 1870, of 122 vessels with 120,029 tonnage.

During the year 1879, 883 vessels of 469,862 tons entered inwards at the various ports with cargoes, and 11 vessels of 4,078 tons in ballast.

Colonial Shipping.—In 1857, the registered vessels belonging to the Colony numbered 186 with a tonnage of 6,662, which increased, in 1876, to 538 vessels representing 44,401 tonnage.

Maritime enterprise has of late developed largely; at the close of 1882, there were 443 sailing vessels built and registered in the Colony, with a total tonnage of 56,751 tons; and 129 steamers giving 15,636 tons. The colony has, also, 28 principal ports of entry, most of them well provided with facilities for shipping, and some with extensive and costly harbour works, docks, &c.

Imports.—The total value of imports at the several ports in 1872 was as follows: Auckland, 1,190,008*l.*; Thames, 29,264*l.*; Russell, 1,059*l.*; Monganui, 370*l.*; Hokianga, 2,049*l.*; New Plymouth, 17,605*l.*; Wanganui, 39,679*l.*; Wellington, 476,886*l.*; Napier, 104,056*l.*; Wairau, 7,897*l.*; Picton, 3,898*l.*; Kaikora, 65*l.*; Nelson, 254,375*l.*; Westport, 94,900*l.*; Greymouth, 193,606*l.*; Hokitika, 154,453*l.*; Okarito, 2,732*l.*; Lyttelton, 629,457*l.*; Akaroa, 180*l.*; Timaru, 41,782*l.*; Oamaru, 19,065*l.*; Dunedin, 1,756,046*l.*; Invercargill and Bluff, 107,720*l.*; Riverton, 15,787*l.*; total, 5,142,921*l.*

Exports.—Auckland, 740,234*l.*; Thames, 1,376*l.*; Russell, 6,349*l.*; Monganui, 474*l.*; Hokianga, 6,878*l.*; Kaipara, 708*l.*; New Plymouth, 689*l.*; Wanganui, 28,541*l.*; Wellington, 328,306*l.*; Napier, 243,064*l.*; Wairau, 80,088*l.*; Picton, 6,720*l.*; Nelson, 65,642*l.*; Westport, 139,201*l.*; Greymouth, 275,193*l.*; Hokitika, 230,135*l.*; Okarito, 11,617*l.*; Lyttelton, 829,260*l.*; Timaru, 29,165*l.*; Oamaru, 14,783*l.*; Dunedin, 1,843,679*l.*; Invercargill and Bluff, 224,340*l.*; Riverton, 34,223*l.*; total, 5,190,665*l.*

Telegraph.—The number of telegraph stations in the colony in December 1870 was 63, being 15 more than in 1868; the number of miles of lines in 1870 was 1,887, being 1,188 more than in 1866; the aggregate number of telegrams (private and Government) was 238,195, against 48,231 in 1866. According to the annual report, July 1873, there were transmitted 568,960 telegrams, being 157,193 more than in the previous year, or 330,765 more than in 1870; the length of line maintained was 2,314 miles (or 427 more than in 1870) at a cost of 9,479*l.*

In 1876, the telegraph line extended a length of 3,170 miles, and the number of messages transmitted during the year, 1,100,599.

On the 31st March 1880, the telegraph represented 3,638 miles of circuit and 9,333 miles of wire, with 234 telegraph stations open to the public.

Railways.—The railways, which, like the telegraph, are all Government property, amounted to 1,172 miles open for traffic, 361 miles in the North island, and 811 miles in the Middle island.

GENERAL SIGNALS FOR ALL NEW ZEALAND PORTS.

The following *general signals* are used at all New Zealand ports. (There are *special signals* for such places as the Manukau, &c., which will be found in their several places.)

Tidal Signals.

Flood tide.—Two balls vertical at masthead, not less than six feet apart.

Last quarter flood.—Three balls vertical at masthead, with not less than six feet between each.

Ebb tide.—One ball at masthead.

Bar or Danger Signals.

Bar signals will be distinguished by their being arranged *horizontally.*

Wait for high water.—A ball at each yard arm, and one on mast half the length of the yard below the yard.

Stand on, take the bar.—Four balls horizontal on the yard, two on each side the mast.

Bar dangerous.—Three balls horizontal on yard, two on any one side of mast, and one on the other.

Put to sea.—Two balls horizontal on yard, on either side the mast.

Note.—Semaphore arms are to be used for piloting vessels over all bars where a pilot establishment is maintained, when pilots are not put on board, and the vessel being piloted is to be steered in the direction towards which the semaphore arm is pointed. When the semaphore arm is dropped, the vessel is to be kept steady as she goes.

Manukau harbour having several channels, special regulations have been issued by the local authorities for the guidance of vessels frequenting that port; and strangers are cautioned against attempting to enter without a knowledge of these local regulations.

Signals to be made from vessels entering or in harbour as required:—

Exempt from pilotage.—White flag at the main.

Pilot required.—Union jack at the fore.

Steam tug required.—Telegraph flag at the peak.

Mails on board.—Commercial telegraph flag at the main.

Health or boarding officer wanted.—No. 8 of commercial code at the main.

Gunpowder on board.—Ensign at the mizen.

Medical assistance wanted.—Union jack over ensign at the peak.

Customs boat wanted.—Union jack at the peak.

Clearing officer wanted.—White flag at the fore.

Police wanted (by day).—Ensign at the main.

Police wanted (by night).—Two white lights vertical at the peak, or at the same height where they can be best seen, four feet apart.

In addition to the above, every pilot station is to be provided with a set of the commercial code of signal flags, which will be used as required.

Night Signals for Open Roadsteads, &c.

From Shore.

A boat will come off.—Two white lights, vertical (as to a steamer coming in).

Boat cannot put off.—Two lights vertical, upper *red*, lower white.

Wait till daylight; boat will put off then, weather permitting.—Two lights vertical, upper white, lower *red*.

Keep to sea; put to sea.—Two white lights, horizontal, with a *red* light between them, to be used for vessels approaching or at anchor.

From Vessels.

Will wait till daylight.—Two lights vertical, upper white, lower *red*.

Cannot wait.—Two lights vertical, upper *red*, lower white.

Cannot keep to sea; put to sea.—Two white lights, horizontal, with a *green* light between them.

NEW ZEALAND MEAN TIME.

Throughout New Zealand one uniform time is kept, called "New Zealand mean time," computed for 172° 30′ E. longitude, or 11h. 30m. 00s., the approximate mean longitude of the New Zealand islands.

CHAPTER I.

FROM THREE KINGS ISLANDS TO HAURAKI GULF, INCLUDING AUCKLAND HARBOUR AND ITS APPROACHES.*

VARIATION IN 1883.

Three Kings islands	13° 0′ E.	Auckland harbour	13° 45′ E.

Vessels from the westward, bound for Auckland harbour or any of the ports on the east side of the North island, should sight the Three Kings, a cluster of islands lying 33 miles W.N.W. of cape Maria Van Diemen, which forms the north-west point of the North island of New Zealand. The group extends 7 miles in a N.E. by E. direction ; Great island being 995 feet, may be seen at a distance of 20 miles.

The north-east and south-west King islands, each three-quarters of a mile in extent, are about 600 feet high ; adjoining the latter island are Princes islets, which stretch 2 miles to the westward, the extreme and highest islet being 350 feet.

The tides and races between these islands run from 3 to 5 knots, and frequently have the appearance of shoal water. H.M.S. *Pandora* sounded the different channels and found no dangers that were not visible :—the only detached danger is Farmer rock, a little above water, which lies eastward of the Great King, about three-quarters of a mile.

Vessels may pass on either side of these islands ; they are uninhabited, and the landing is dangerous and uncertain at all times. Formerly it was recommended they should be passed on the north side at a distance of 6 miles, as by so doing the strong currents in their immediate vicinity would be avoided, as also the tide races which exist between them and the land.

Since, however, that a powerful light has been established on cape Maria Van Diemen, there is no longer any necessity for this, if caution be taken to guard against the strong currents and tide races before-mentioned, except for sailing vessels without a commanding breeze.

Whichever landfall is made, a course should be steered to pass the North cape (*Otou*), at a convenient distance, and, if desired, it may be approached within one mile.

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* *See* Admiralty coast charts of New Zealand, sheets I. and II., Nos. 2,525 and 2,543 ; scale, $m = 0 \cdot 3$ of an inch.

NORTH CAPE bears from the north King island E. ¾ S. 47 miles. It is a steep flat-topped cliff 790 feet high at the cape, sloping for 2½ miles to the north-west, and on a nearer approach it exhibits a reddish appearance. Off the pitch of the cape, but connected by a ledge of rock, is a peaked islet; and for one-third of a mile N.E. by E. of the islet is foul ground, with a rock at its extremity only uncovered at low water.

CAPE BRETT.—Being abreast of the North cape, distant 6 miles from it, an E. by S. ¾ S.* course should lead 10 miles outside cape Brett, the easternmost cape of the Bay of Islands, a remarkable bold quoin-shaped headland 1,220 feet high, with a round hummock, about 300 feet high, on its extreme point. It bears E.S.E. from the North cape, and is 78 miles distant.† A high steep islet (Piercy islet), perforated with a hole or archway, lies N.N.E. from the cape, one-quarter of a mile distant. Cape Brett may be seen in clear weather from a distance of 25 to 30 miles.

POOR KNIGHTS.—On rounding cape Brett, the Poor Knights islands (*Tawiti-rahi*) will be seen; they are two rugged looking islands, the northern being 590 feet, and the southern 680 feet high, lying close together, and extending in a north and south direction 2½ miles; their north end bears from cape Brett S.E. by E. ⅓ E. 26 miles, and their distance from the nearest point of the mainland is 11 miles.

Poor Knights rocks.—Three miles S. ½ E. from the south extreme of these islands, is a group of three cone-shaped islets, and a fourth islet (Sugar-loaf) of similar character, S. ½ W. 4¾ miles; they are from 150 to 200 feet high, and can be seen at a distance of 10 or 12 miles.

Directions.—Steer for the Poor Knights islands, passing on either side: the water is deep, 64 fathoms, and there are no dangers. Should these islands be passed on the outside at a distance of 2 miles, a vessel, when abreast of them, should steer S.S.E., which is a direct course into the Hauraki gulf, and leads nearly midway between the Hen and Chickens group, and the Moko-hinou and Fanal islands.

BREAM HEAD (*Tewara*) is a remarkable cape, 1,500 feet in height, very rugged and craggy, and its summit resembles the head of an animal, having two nipples or ears on it; it is the north head of Wangari bay and harbour, and bears from the southernmost Poor Knight S. ¾ W. 22½ miles. *See* page 67.

HEN AND CHICKENS.—Moro-tiri islands, the Chickens, are a group of four islands (with some islets off their western end), lying in an E.N.E. and W.S.W. direction, and 5 miles in extent; the highest attains an elevation of 725 feet. They bear from the southern Poor Knight S. by E. 23 miles; from Bream head, the western Chicken bears E. by S. distant 5 miles. A sunken rock lies nearly midway between the two western Chickens, which are one mile apart; otherwise the group is clear of dangers.

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* For nine months out of the twelve, a vessel will find herself off the Poor Knights at daylight, owing to the offset from the coast; therefore, if the weather permits and the coast is visible, the course should be regulated accordingly.—Captain Drury's Remarks.

† *See* page 59.

Taranga island, the Hen, lies 3½ miles to the southward of the Chickens; it is 2½ miles in length from east to west and one mile from north to south, with a remarkable double peak 1,350 feet high on its western end, somewhat resembling Bream head.

Toutorou.—Two miles southward of the west end of Taranga island, is Toutorou or Sail rock, a steep islet resembling from many points of view a fore and aft schooner. Between Sail rock and Bream tail lies McGregor rock, for description, *see* page 73.

MOKO-HINOU and FANAL ISLANDS.—The Moko-hinou islands lie 16 miles to the eastward of the Moro-tiri islands. They are the westernmost, a group of three islands, about 250 feet high, which lie close together in a north-east and south-west direction for about 1½ miles: they bear from the southernmost Poor Knight S.E. ⅛ E. 29 miles, and from the east Chicken E. ¾ N. 15¾ miles. W. by N. 1¾ miles from the south-westernmost Moko-hinou island, is a smaller one, lying north-west and south-east, nearly half a mile in length with rocks off each end. There are no dangers about these islands but what are visible, with the exception of a sunken rock off the S.W. end of the south-western islet.

LIGHT.—A lighthouse, a white tower 46 feet high, stands on Burgess islet, Moko-hinou islands, from which, at an elevation of 385 feet above the sea level, is exhibited a *flashing* white light of the first order, showing a flash every *ten* seconds, visible all round seaward, and in clear weather should be seen from a distance of 26 miles.

Fanal island lies E. by S. ½ S. 2¼ miles from the south-west Moko-hinou; it is little more than half a mile in length. Three-quarters of a mile N. by E. of it lies a long reef, half a mile in extent east and west, and always above water.

Rocks.—From the south-west point of Fanal, Navire rock lies S. by W. ¾ W. three-quarters of a mile, and the Simpson rock S. ½ W. 3¾ miles. Both these rocks are well out of water, and Simpson rock may be seen 3 miles off.

Directions.—Having passed the Hen and Chickens, the same course S.S.E. leads between Rodney point and Little Barrier island, nearly in mid-channel, and about 3 miles eastward of Flat rock off Kawau island.

Vessels entering the Hauraki gulf from the northward, should always pass inside or westward of Little Barrier island.

LITTLE BARRIER ISLAND (*Houtourou*) N.E. by E. 11½ miles from Rodney point is a very remarkable island, 4 miles in length from north to south, and 3½ miles broad, steep, and almost inaccessible; it rises 2,380 feet above the sea, and has on its summit several distinct peaks of nearly the same elevation; hence it has received the name of mount Manypeaks. A low and remarkable stone boulder point, steep close-to, forms the south-west extreme.

RODNEY POINT, which may be considered as the western entrance point of the Hauraki gulf, is bold and cliffy, and has no dangers off it; it is backed by mount Hamilton, a remarkable wooded hill 1,300 feet high, with two round summits, bearing W.S.W. 6 miles from the point.

HAURAKI GULF.—The principal entrance to the Hauraki gulf is between Rodney point and Little Barrier island, a breadth of 11 miles clear of danger. Between the Little and Great Barrier islands (the latter an island of considerable extent, and high) is a passage of 8 miles in width. The Horn rock lies nearly midway between them, and is the only danger,—it bears from the south-east end of the Little Barrier E. by S. ½ S. 4 miles, and breaks when there is any swell.

TAKATAU POINT is S.E. ¾ S. 5¾ miles from Rodney point, and has several conical rocks standing on its extremity; it is the north point of an extensive bight, which will be treated of in describing the coast and harbours hereafter.

KAWAU ISLAND, nearly 2 miles south of Takatau point, is 4 miles in length in a N.W. and S.E. direction, and 3½ miles broad; and until the channel between it and Takatau point is opened out, the island will appear like the continuation of the mainland. *See* page 74.

FLAT ROCK, 2 miles eastward of the south-east point of Kawau island, is 4 feet above high water, resembling in size and appearance the hull of a large boat, and can be seen plainly at a distance of 4 miles from a vessel's deck; it is steep to, and may be passed on either side. It bears from Kawau point, E. by N. ½ N. 2 miles; Takatau point, S.E. 5½ miles; south-west extreme of Little Barrier island, S. by W. 14¾ miles; and from north-west extreme of Tiri-tiri island, North 9 miles.

Beacon.—Flat rock is marked by a black beacon with a cage surmounted by a diamond.

TIRI-TIRI ISLAND is 1½ miles long in a north-west and south-east direction, and bears S. by E. from the south-east end of Kawau island distant 8½ miles.

LIGHT.—The iron lighthouse, 48 feet high, painted red, and 300 feet above high water, stands on the south-east part of Tiri-tiri island; it exhibits a *fixed* white light, that in clear weather is visible 23 miles.

A sector of *red* light is shown from this lighthouse, extending through an arc of about 23°, from over Flat rock towards Kawau island, or between the bearings of S. ½ E. and S.S.E. ¼ E.

SHEARER ROCK with 2 feet on it at low water, and steep-to, lies from the east point of Tiri-tiri island E. by N. nearly one mile distant.

Buoy.—A red buoy marks the position of Shearer rock, but as it is moored in 14 fathoms water, it is liable to be washed away; vessels from this circumstance have struck on the rock: from the buoy, the lighthouse bears W.S.W., distant about one mile; the north extreme of Tiri-tiri island, W. by N. ⅝ N.; and its south extreme, S.W. ⅝ W.

Directions.—After passing Kawau island, the passage to Auckland may either be made eastward of Tiri-tiri island, or through the Wangaproa passage westward of that island; if the former course be adopted, Tiri-tiri island should not be passed within 2 miles to avoid the Shearer rock.

WANGAPROA PASSAGE.—Should this passage be taken, it will be found perfectly safe and easy, having a clear working width of 1¼ miles, with a depth from 9 to 15 fathoms. A rock, which dries nearly 2 feet at low-water springs with 6 fathoms water around, lies fully 1½ cables W.S.W. from the north-west point of Tiri-tiri island; and shelving tidal rocks extend north-east, one-third of a mile off Wanga point, the north-east extreme of Wangaproa peninsula, as also some rocky ledges a cable off the other points of the peninsula. The shores therefore should not be approached too near on either side. A reef awash lies 2 cables off the south side of Tiri-tiri island, but this does not interfere with the navigation of either passage (*see* p. 82).

Directions.—From a berth 2 miles eastward of Shearer rock, 10¼ miles on a S.S.W. course, or from the centre of the Wangaproa passage, the same distance on a S. ½ E. course, will take a vessel into Rangitoto channel, which is 1½ miles wide; and when in it, the mid-channel course is S.E. 2½ miles to abreast the North head of Auckland harbour. From Tiri-tiri island and generally from some miles to the northward of it, Rangitoto, and the adjacent islands eastward, will be plainly seen.

RANGITOTO ISLAND cannot fail to be immediately recognized; it is circular in shape, about 3½ miles in diameter, and rises gradually to a height of 920 feet with a crater-like summit, on which are clearly to be distinguished at a distance of 7 or 8 miles three nipples, and has this peculiar feature, that, taken from every point of view, it presents the same appearance. The island is almost bare of vegetation, its summit being composed entirely of masses of scoria. It is connected with Motu-tapu, the island next to the eastward, by a sandy neck a quarter of a mile long, dry at low water.

Rangitoto, Motu-tapu, Rakino and Otatou islands form a chain extending 3 miles in a N.E. by N. direction from the north-west part of Rangitoto. Between Motu-tapu and Rakino is a passage half a mile wide with a depth from 4 to 11 fathoms. An islet lies one cable off the south point of Rakino, and a rocky patch at 2 cables S.E ½ S. from the islet, and nearly in mid-channel. This passage is seldom used except by small vessels.

The Otatou islands are 1½ miles north of Rakino with Orarapa islet in the channel between. The western Otatou island is free from danger. To the eastward of these islands, about 2 miles, are the David rocks and Ahaaca reef, the latter awash at high water.*

Rangitoto Channel Dangers.—Several rocky ledges, forming a reef, extend off the western shore of Rangitoto island and are marked by a beacon. A sunken pinnacle rock, having a depth of 4 feet at low water and 21 feet close around, lies about 6 cables south-eastward of Rangitoto reef, with Bean rock lighthouse (at night the *green* light) S.S.E.; north cone of Rangitoto island N.E. by E. ½ E., and the beacon on Rangitoto reef N. by W. ¾ W.

A black buoy marks the rock on its west side.

Vessels should not pass inshore of this buoy, as rocky ledges extend some distance off shore.

Between the beacon and black buoy, the depth of water to a distance of about one-quarter of a mile off shore is considerably less than was formerly supposed; a depth of 4½ fathoms at low water was found at 2½ cables W.S.W. from the beacon.

On the opposite shore of Rangitoto channel an outlying sunken rock, with only one foot on it at low water, lies half a mile N.W. by N. from Takapuna head, the first point of land northward of the North head of Auckland harbour, and distant from it three-quarters of a mile.

Buoy.—A black cask buoy marks the north side of this sunken rock, which is steep-to, having 3 fathoms close all round. From the rock the flagstaff on mount Victoria bears S. ¼ E.; buoy on Rough rock, S.E. by E. ¾ E.; and Rangitoto peak, N.E. ½ E.

Rough rock, on the western side of Rangitoto channel, with 7 feet at low water, lies N. by E. three-quarters of a mile from the North head of Auckland harbour; it may be passed on either side, but to the eastward is preferable.

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* *See* Admiralty plans, Auckland harbour, No. 1,970; scale, $m=4 \cdot 3$ inches; *also* entrances to Auckland harbour, No. 1,896; scale, $m=1 \cdot 0$ inch.

Buoy.—Rough rock has a buoy chequered red and white on its shoal part.

A rocky patch, about one-third of a cable in extent, having only 8 feet on it at low water, with 2½ and 3 fathoms on its edges, lies between Takapona head and Rough rock.

Buoys.—A red buoy marks the east side of the patch in 2½ fathoms at low water, with Takapona head bearing W. by S., 2¾ cables; Rough rock East 3¼ cables; and the extreme of North head S. by E. ½ E. 6½ cables.

Sandbank.—A sandbank, about half a cable long, lies to the southward of Rough rock, with 12 feet water on it at low water.

Buoy.—It has a striped red and black buoy on its south-eastern edge, in 3 fathoms at low water, distant 2½ cables S.S.E. ¼ E. from Rough rock. From it mount Eden appears just open of North head, S.S.W. ¼ W.; and Takapona head bears W. by N. ½ N. distant 7 cables.

Caution.—Vessels entering or leaving Auckland harbour, should not approach too near the western shore of Rangitoto channel, as rocky ledges and foul ground extend from 2 to 3 cables off it. Neither is it prudent for large vessels to take the channel in-shore, or westward, of the Rough rock and the 12-feet sandbank.

Vessels passing in-shore of Rough rock should not approach the buoy within one cable, as foul ground extends for some distance around the rock.

AUCKLAND HARBOUR.—The North head of this harbour and mount Victoria, half a mile to the westward, are two remarkable round hills, easily distinguished at a distance of 2 or 3 leagues. Mount Victoria is 280 feet high, and has a signal and pilot station on its summit. For New Zealand general harbour signals, see page 15.

The North head should not be approached nearer than a quarter of a mile, as a sandy spit extends off it. On opening out the town of Auckland, which stands on the south shore of the harbour, 2 miles from the entrance, the water deepens to 8 and 9 fathoms, and the channel, which lies in a W. by S. direction, maintains an average breadth of three-quarters of a mile.

Depôt point is on the north shore three-quarters of a mile within the North head, on the point is a white storehouse. A spit, which dries in patches, extends from this point E. ½ N., 3½ cables, its extremity being marked by a pole beacon.

Buoy.—A red buoy is moored in 4½ fathoms off Depôt flat.

Caution.—The south shore of the harbour is shallow, with mud-flats and rocky patches which dry some distance off; this shore therefore should not be approached within one-third of a mile; or in beating up, tack at the first shoal cast.

LIGHT. — Bean rocks which uncover at low water, are E. by S. from the North head nearly one mile distant, on which, at an elevation of 50 feet above high water, a *fixed* light is exhibited that in clear weather should be seen from a distance of about 10 miles; the *red*, white, and *green* colours are respectively seen as follows:

Red.—Between the bearings W. ½ S. and S.W. by W. ¾ W. in Tehmaki strait, and on the south side of Koreho channel, including the reef north of Koreho island.

White.—Between the bearings of S.W. by W. ¾ W. and S.W. ¼ W. in the fairway of Koreho channel, and the south-east side of Hieh channel.

Green.—Between the bearings S.W. ¼ W. and S.S.E. ½ E. on the north-west side of Koreho and Hieh channels, including the east side of Rangitoto channel and Rangitoto reef.

White.—Between the bearings S.S.E. ½ E. and S.E. ¾ S. in the fairway of Rangitoto channel.

Red.—Between the bearings S.E. ¾ S. and E. by N. ¾ N. on the west side of Rangitoto channel, including Rough rock and the north shore of the harbour, with Depôt point sandspit and buoy off Depôt flat.

White.—Between the bearings E. by N. ¾ N. and N.E. ½ E. in the fairway of the harbour.

In-shore the light is eclipsed between the bearings N.E. ½ E., through north, to W. ½ S.

Note.—The iron framework, from which the light is exhibited, is not conspicuous from seaward by daylight.

Directions.—Vessels entering Auckland harbour at night by the north or Rangitoto channel, should make the white or fairway light, steering in on this ray of light until the summit of the North head bears S.W.; then keep away south across the *red* into the white (harbour) fairway light, bringing the three white lights (in a triangle) on Queen's wharf to bear W.S.W., which will lead up the harbour to the usual anchorage ground below the wharf.

Note.—These triangular lights, at 3 miles distance, appear as one, and are not easily distinguished from the lights of the town.

Vessels having to work in should not enter the *green* light when near Rangitoto reef, that is, when the peak of Rangitoto bears E. ¼ N.; nor the *red* when the summit of mount Victoria bears S.W. ¼ W., as this bearing leads on to Rough rock; and they must also keep well in the white light when passing Depôt point sandspit.

Vessels entering by Tehmaki strait will see the *red* light over the low southern part of Koreho island, and taking care not to approach within one mile of the island, pass through the *red* into the white fairway light of Koreho channel; then steer so as to pass about 2 cables N.W. of the lighthouse, (observing that Rangitoto centre peak bearing N. ½ W. and the intersecting line of white and *green* lights S.W. ¼ W., mark the position of the 10-feet patch in this channel, the white light therefore should not be lost sight of until the peak bears North), crossing the coloured lights of the Rangitoto channel, into the white harbour fairway light, and for the anchorage as before described.

Vessels entering by the Hieh channel will keep on the line (S.W. ¼ W.) intersecting the *green* and white lights, edging away into the white in passing the north-west extreme of Hieh island, and thence up the Koreho channel and into the harbour as before described.

Beacon.—A beacon marks the northern extreme of Bastion reef, and from it the lighthouse bears N.W., distant 3¼ cables.

HARBOUR LIGHTS.—A railway wharf extends 1¾ cables in a northerly direction from Britomart point. Two fixed *red* lights, placed vertically, are exhibited from a post at the north-east angle, and a *fixed* white light from the western extreme of this wharf.

From the eastern extremity of Queen's wharf, which is over 1,500 feet long, and a continuation of Queen Street (the principal thoroughfare of the town), are shown, in the form of a triangle, three *fixed* white lights at an elevation of 29 feet.

These wharves form Commercial harbour; alongside the latter the largest merchant vessels, as also the San Francisco, Honolulu, Australian, and New Zealand mail steamers can lie in deep water.

Buoys.—A red buoy, moored in 3¾ fathoms, lies three-quarters of a cable N. 49° E. from the north-east extreme of the Railway pier; also one of the same colour, in 4 fathoms, three-quarters of a cable N. 42° W. from the north-west extreme of the same pier. Between the buoys is a depth of 3¾ to 4 fathoms water.

Anchorage.—Merchant shipping are generally berthed by the pilot opposite Commercial harbour;—Men-of-war berth east of a line produced through Stanley and Onepolo points, with Britomart point S.W. ½ W. in 5 to 6 fathoms mud. Other vessels (with powder on board) should anchor between a line drawn from the eastern head of Judge's bay to Depôt point, and a line due North from the western point of Judge's bay to the opposite shore. The limits of Auckland harbour, to the eastward, may be said to be between a line drawn from the North head to Bastion rock; and to the westward, from Stokes point to the Sentinel rock.

Opposite the town the harbour has a depth of from 5 to 9 fathoms, and its breadth across three-quarters of a mile.*

Docks.—To the westward of Queen's wharf is situated a graving dock, 310 feet long with an entrance breadth of 44 feet, and a depth over the Sill of 13½ feet at high-water springs.

A dock is in course of construction at Calliope point, on the north side of the harbour which, it is reported, will be 500 feet long, 90 feet wide between the copings, with a depth over the Sill of 30 feet at high-water springs.

Coaling station.—The port of Auckland, which has excellent harbour accommodation and easy of access, will, on the completion of the dock in course of construction on the north shore, and also the line of railway, some portion of which has already been made; to connect Auckland with the northernmost part of the island, offer, great facilities for the establishment of a coaling station, owing to its close proximity to the coal-fields at the bay of Islands, Wangari, Waikato and Bridgewater. The distances of the two former, by water, are respectively 120 and 75 miles to the northward; Waikato is 65 miles from Auckland by rail, whilst Bridgewater (Foote's) mine is 42 miles by water and rail. The output of the latter is about 300 tons per month, but capable of producing 4,000 tons per month.

For further information regarding the other coal-fields, see under their head of district.

Tides.—It is high water, full and change, in Auckland harbour at 7h. 5m.; springs rise 11 feet, neaps 9 feet. The velocity at springs seldom exceeds 2 knots.

The WAITEMATA RIVER continues its westerly direction 2 miles from the harbour limit, and is navigable for ships of large tonnage.

The navigable channel at Stokes point is 4 cables wide, which narrows to 2½ cables at and above Kauri point, whence the main river trends to the northward and westward for about 8 miles to the falls at its head; a little below which is the landing place at Harkness point, where the Auckland river steamers connect with the Kaipara railway, daily.

The Whau, a narrow creek opposite Kauri point, and trending to the southward, is navigable some distance for small vessels, and has 15 feet at its entrance at low-water, but dries at its head, which is separated from the waters of the Manukau by a portage of 1½ miles.

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* Ships' compasses may be adjusted at Auckland; the charges are, for vessels under 50 tons, 3*l.* 3*s.*; 50 tons to 100, 4*l.* 4*s.*; 100 tons to 300, 5*l.* 5*s.*; 300 tons to 500 6*l.* 6*s.*; over 500, 7*l.* 7*s.*

At 1½ miles north-westward of the Whau entrance, is the entrance to another creek, also branching off to the southward for some distance to Henderson's mill.

Outside anchorage.—Should it be necessary to wait for daylight, or any other cause, to enter Auckland harbour, anchorage with southerly or westerly winds may be obtained in the bight north of Wangaproa peninsula in from 12 to 16 fathoms; or, if advanced to the southward of that peninsula, anywhere between it and Rangitoto island, in from 8 to 10 fathoms. When sufficiently far south to be protected by the islands of Rangitoto, Motutapu, &c., safe anchorage in 6 and 7 fathoms may be had in almost any weather; and strangers are recommended to adopt this course rather than attempt to enter the harbour at night, unless the Bean rocks light, or the Rangitoto shore and the North head of Auckland are plainly made out.

From AUCKLAND to the N.E.—Vessels bound to the northward from Auckland will find the Rangitoto channel the safest and easiest, as well as the most direct, and the directions already given will be found sufficient. This channel is also recommended to vessels bound to the eastward and intending to pass out of the Hauraki gulf between the Great Barrier island and cape Colville, for this reason, that after passing Rangitoto island, one course N.N.E. ¾ E., leads clear of everything, and direct for that passage, westward of the Otatou islands at a distance of 2 miles, thereby avoiding the David rocks and Aha-aha reef, an extensive cluster occupying a space of 2 miles, lying one mile eastward of the easternmost Otatou island; and likewise D'Urville rocks, which are 3 miles eastward of David rocks.

From the westernmost Otatou island to cape Colville is N.E. ½ N. 22 miles; and from a berth 2 miles off that island, 24 miles on a N.N.E. ¾ E. course will carry a vessel abreast, and to the northward of Channel islet (*Takoupo*), a steep rock, 270 feet high, lying N.N.W. 2¾ miles from cape Colville. After passing Channel islet, which may be done on either side, though to the northward is preferable, as there is frequently a heavy swell setting on cape Colville, a ship bound to the southward should edge away E. ½ S., passing between Cuvier* island and the D'Haussez* group.

The passage between cape Colville and the south end of the Great Barrier island is 7½ miles wide in its narrowest part.

KOREHO and HIEH CHANNELS are to the north-east of Auckland, and the former, which leads into the Hieh and Waiheki channels, is between Rangitoto island and the mainland. With a north-west wind which blows directly through the Rangitoto passage, it may be sometimes convenient to pass to sea through the Hieh channel, between the island of that name and Motu-tapu; it is three-quarters of a mile in width, and has a depth of from 8 to 13 fathoms.

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* Names given by Dumont d'Urville, who visited a portion of this coast in 1827.

Directions.—Leaving Auckland harbour, when in mid-channel between its North head and Bean rocks, steer N.N.E. for the centre peak of Rangitoto island for about half a mile, or until the flagstaff on mount Victoria is in line with the south end of the white sandy beach immediately to the northward of the North head of Auckland harbour. These marks will carry a vessel in 3 fathoms at low water, to the southward of a 15-feet shoal 2 cables in extent; and northward of a 10-feet patch lying S.E. by E. ½ E. 3 cables from it, at the distance of a cable from each.

The 15-feet shoal is chiefly mud, and from it Rangitoto centre peak bears North 1$\frac{8}{10}$ miles; North head of Auckland, S.W. by W. ¼ W. 2 miles; and Bean rocks lighthouse, S.W. by S. 1$\frac{3}{10}$ miles.*

When the peak of Rangitoto island bears N.N.W., a course may be steered N.E. ¼ E. for Hieh channel, passing Koreho island at the distance of about three-quarters of a mile. On the port hand, about 3 cables from the Rangitoto shore, is a 5-feet patch, with a red and white buoy on it.

Beacon.—A beacon marks the northern extreme of the reef, off the eastern end of Koreho island. The reef extends from the eastern end of the black sandy bay, 2 cables to the beacon, thence south-east about 3 cables. To the westward of the beacon the ground is clear, with one to 1½ fathoms at low water. The beacon dries at low water; from it the east end of Koreho is on with the east entrance point of Tehmaki river, S.S.E.; west extreme of Koreho island on with mount Eden, S.W. ½ W.; and south end of Hieh island, E. by N. ½ N.

Directions.—In passing through the Hieh channel, neither the north-west head of Hieh island nor the south point of Motu-tapu should be approached within 2 cables, as some rocks lie off both.

When Hieh island is passed, the channel between Motu-tapu and Waiheki island increases to a width of 2 miles, with deep water all over, and a N.E. by N. course for 7 miles will take a vessel mid-channel between David and D'Urville rocks, both groups are steep-to, at a distance of 1¼ miles from either.

The south-eastern rock of the David group, the highest and well out of water, lies E. ¾ S. 1$\frac{6}{10}$ miles from the south extreme of east Otatou island, with a reef extending N.E. by N. half a mile from it. Three-quarters of a mile N.N.E. of this ledge is the Aha-aha reef, awash at high water, 3 cables in extent from north to south, with its northern end bearing E. by N. 3 miles from the north-western extreme of Otatou islands.

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* In 1878, H.M.S. *Nymphe*, drawing 17½ feet, grounded at the commencement of a flood tide in Koreho channel with the leading mark on, and Rangitoto centre peak bearing N. ½ E., supposed to be an extension of the 15-feet shoal.

D'Urville rocks lie E. ¼ N. 3 miles from the high David rock, having 3 feet water over them at high-water, and are dangerous to vessels using this channel. The north-west extremes of Hieh and Waiheki islands in line S.W. ¼ S., just clears them to the south-eastward; and the north-west extreme of Waiheki S.S.W. ¾ W. (or a little south-eastward of the neck of Hieh island) clears north-westward of them. Having passed them, haul up N.N.E., or with a north-west wind as high as a vessel will lie for cape Colville passage.

TEHMAKI STRAIT and WAIHEKI CHANNEL.— The Waiheki channel, which lies between the islands Waiheki and Ponui, is convenient for vessels bound to Coromandel harbour, or the river Thames from Auckland; and vessels working up for Auckland from the eastward will by using it, have the advantage of smooth water and anchorage in Tehmaki strait, which is formed by Waiheki island on the north and the mainland on the south side, with excellent anchorage in every part, in from 4 to 6 fathoms, muddy bottom. The only deviation from these uniform soundings is a shell bank, nearly in mid-channel, with 3 fathoms at low water, bearing from the north point of Clarke island (*Motu-karaka*) N.E. ½ E. 3½ miles, and from Maraitai point on the mainland N. by W. 1½ miles. A rocky ledge extends some distance off this point.

Tehmaki river is immediately south of Koreho island, and extends 8 miles to within little more than half a mile of the head waters of the Manukau. The entrance points are 1¼ miles apart. A ledge of rocks, with a beacon on the outer end, extends a quarter of a mile from the western head. Between the entrance points, one-third the distance across from the western head, is a bank 3½ cables long and one cable broad, which dries at low water, running parallel with the shore. The entrance of the channel, a quarter of a mile in width, is between this bank and beacon, and the leading mark is an inner beacon erected on a point of the eastern shore, 1½ miles within the entrance point, on with McLean's house (a conspicuous building inland) S.E. ½ E., passing about half a cable outside the outer beacon in from 15 to 18 feet.

About six-tenths of a mile from the outer beacon and abreast the inner end of the bank before-mentioned, a shoal belt nearly 2 cables across with 6 and 7 feet on it at low water, has to be crossed, whence the water deepens to 27 and 30 feet to abreast the inner beacon point, which is bold-to. Buckland's wharf and landing place for cattle is in the bay, one-third of a mile below beacon point. Off it is the usual anchorage in 24 feet at low water, and vessels lying here any time should moor, as the tides run strong and the channel is narrow.

Above beacon point, which should be kept on board to avoid the spit which extends from the opposite projecting point, the river turns to the westward. At Panmure, 3 miles further up, is a depth from 12 to 15 feet at low water. A substantial bridge crosses the river here, which at its eastern side opens for vessels to pass through. The Tehmaki river is much used by local steamers and small coasters.

Wairoa river (in the deep bight south-westward of Pahiki island) is 160 yards wide at the mouth ; there is one foot at low water at the entrance, but within, the average depth is 6 to 4 feet, with a channel 125 yards wide. The first reach of half a mile has a depth of 6 feet, then 4 feet until 3 miles from the heads ; above this it is shallow. A beacon marks the entrance, and there is steam communication with Auckland.

Tides.—It is high water, full and change, at the entrance at 7h. 15m. ; rise of tide 8 feet.

Directions.—After having cleared the 10-feet shoal in Koreho passage as before directed, and the island of Koreho passed on its north side at half a mile distance, keep to the southward of Hieh island, and when about the same distance from it steer E. ¼ N. for Passage rock, which will then be 9 miles distant.

Passage and Sunday rocks.—The former is 40 feet high, and may be passed close on either side. In a direct line between it and the northern or outer extreme of Ponui head, nearly 1¼ miles from each and about 3½ cables off the nearest part of Waiheki, lies Sunday rock, with 8 feet at low water ; it bears from the south point of Waiheki, E. by N. ¼ N. half a mile ; and from Thames point, (west point of Ponui,) N. ¾ W. eight-tenths of a mile. In the channel on either side of Sunday rock are 9 and 10 fathoms.

Directions.—If Passage rock is passed on the north side, the Waiheki shore should be kept on board within 2 cables for 1½ miles after passing it, (keeping Ponui head on the starboard bow,) until the bay south of Finger point is opened out ; a vessel will then be well clear of Sunday rock.

If Passage rock is passed on the south side, a course should be steered for the point, or hill over 240 feet high, next south of Ponui head for 1½ miles, or until Thames point bears S. by W. ½ W. ; the channel then becomes three-quarters of a mile wide, with from 6 to 12 fathoms water in it. Ponui head should not be approached within a cable, as some rocks lie off it.

Rotaro and Pakatoa islands.—Northward of Ponui island, and in a line between it and Kauri point, the eastern extreme of Waiheki, are the small islands Rotaro and Pakatoa, forming a continuation of the eastern side of the channel, with narrow channels between them, only used by coasters. W. ¾ S. half a mile from the round south head of Rotaro, is a cluster of rocks, awash at low-water, a quarter of a mile in extent.

Single rock lies S.W. half a mile from the south-west point of Pakatoa, it is above water, with deep water close to. Midway between it and the same point, is a reef awash at low water; but vessels have no occasion to pass eastward of Single rock, between which and Waiheki island is the main channel, three-quarters of a mile wide.

From the north point of Pakatoa, a reef extends 2 cables northward with a conspicuous rock above water near its extremity. Between it and the nearest point of Waiheki, is the Waiheki channel half a mile wide, with a depth of 15 fathoms in its narrowest part.

Water.—Opopo bay, at the east end of Waiheki island, is a favourite watering place; a vessel may anchor as near as convenient to the stream.

Tarakihi islet.—In passing out of the Waiheki channel, this bare rocky islet will be seen, 1½ miles eastward from Pakatoa, generally covered with cormorants; there are no dangers near.

Horuhoru islet, 40 feet high, lies off Thumb point, the northern point of Waiheki island, N. by W. ¾ W. nine-tenths of a mile, with deep water between.

When clear of the Waiheki channel and abreast Tarakihi, 23 miles on a N. ¾ W. course, will take a vessel to the westward of Channel islet (*Takoupo*), and into the channel between cape Colville and the Great Barrier island.

The Sandspit passage lies between the southern part of Ponui island and the extreme of Pauhenehe spit, which is composed of shingle, extending from the north-east extreme of Pahiki island N.E. by E. 6 cables. At the spit end, in 6 feet at low water, the lighthouse is erected.

LIGHT.—A fixed white and *red* light is exhibited from the lighthouse at an elevation of 50 feet above high water, and is visible about 9 miles. It changes from white to *red* on or about a W.N.W. and E.S.E. bearing, being the night mark for clearing the shoal off Oreri point.*

The lighthouse is an open frame structure supporting the keeper's dwelling, painted white and surmounted by the lantern.

Directions.—Vessels intending to pass through this channel from Tehmaki strait should, when abreast of Passage rock and distant one mile from it, bring the lighthouse to bear E. by S. ¾ S., and steer for it until the points on the north-western side of Pahiki island are in line, which will be abreast the rocky south-west point of Ponui, and which also should be passed at the distance of a full cable, to avoid the rocks which lie off it. Hence steer to pass about half a cable northward of the lighthouse, by which the elbow of the spit, which extends W. by N. 3 cables from the lighthouse, will be avoided. From the position abreast Passage rock, before-mentioned, the deepest part of the channel is only from one to 2 cables wide, with an irregular depth of from 3½ to 5 fathoms, shoaling gradually towards the south shore, and with an uniform depth of about 2½ fathoms towards Ponui.

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* This light has never been officially notified, but its arrangement is supposed to be thus:—*Red* from outside Oreri shoal to Raukura point, thence dark to Whakakaiwaru point, and the rest of the circle white.

When abreast the lighthouse, alter course immediately to the south-eastward, to clear the rocks off Ponui shore, keeping the same distance off the lighthouse; thence, if bound to the Thames, pass about 2 miles northward of Oreri point, off which extends a patch of rocks half a mile from the shore and dry at low-water, and with shoal water outside them for another mile, on which there is a break with a northerly swell.

The summit of Karamu-ramu islet (south of Pahiki) kept open of Raukura point W. ½ S., clears this danger to the northward ; by night keep in the white light. From the position off Oreri point, the course to the Thames is S.E. by E. ½ E. about 15 miles.

Tides.—On the eastern coast of the North island the flood stream runs to the northward, and the ebb to the southward, at the rate of about one knot per hour ; but in the Hauraki gulf they take a contrary direction, the flood running south and the ebb north. The body of the flood stream, entering from the southward between cape Barrier and cape Colville, separates about False head on the west side of the Great Barrier island, and sweeps round to the southward, filling the Thames and Waitemata rivers through the different channels leading to Auckland. The ebb tide runs from one to 1½ knots to the south-east between Great Barrier island and cape Colville, but inshore much stronger. The range of tide in the Hauraki gulf is from 4 to 10 feet.

In the Wangaproa channel the tides run from one to 2 knots; in Waiheki strait, half a knot; but from 2 to 3 knots in the adjoining narrow channels.

The preceding directions will, it is hoped, be found sufficient, with the Admiralty coast charts and plans, to guide the mariner from the Three Kings islands to the harbour of Auckland, and to sea again by the different channels. It is proposed now to offer a particular description of the north and north-east coast of the North island, and the intermediate ports.

CHAPTER II.

THE COAST FROM CAPE MARIA VAN DIEMEN TO CAPE BRETT, BAY OF ISLANDS—FROM CAPE BRETT TO AUCKLAND HARBOUR—THE FRITH OF THAMES.

VARIATION IN 1883.

Cape Brett - 13° 15′ E. | Cape Colville 13° 40′ E.

FROM CAPE MARIA VAN DIEMEN TO CAPE BRETT.

The portion of the North island between cape Maria Van Diemen and the North cape, a distance of 21 miles in an E.N.E. and W.S.W. direction, has no place of shelter along its coast, which is nearly straight, the hills rising almost immediately from the sea to a height of from 700 to 1,000 feet. Although no positive dangers are known of this coast besides those which will be described, yet there seems no inducement for vessels to approach very near it, more particularly as strong tides and currents are known to exist; vessels passing from the east side of the island to the west, or the contrary direction, are consequently recommended to give this north coast a berth of 4 or 5 miles: at this distance off shore soundings will be found in 30 or 40 fathoms, increasing in depth as we proceed eastward: a whirlpool is reported to have been seen in this neighbourhood, but it was not met with by H.M.S. *Pandora*, during her examination of the coast.*

CAPE MARIA VAN DIEMEN, the north-west extreme of the North island, is a projection from a sandy isthmus, 420 feet high, and appears like an island from seaward: immediately north-west of it is a double islet about a mile in circumference, but with no channel between.

LIGHT.—A lighthouse 20 feet high, constructed of wood and painted white, stands on the double islet; and at an elevation of 330 feet above the sea, exhibits a *revolving* white light attaining its greatest brilliancy *every minute*, and should be seen in clear weather from a distance of about 24 miles.

From the lower part of the lighthouse, a sector of *red* light of about 30 degrees is shown in the direction of Columbia reef.

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* *See* Admiralty chart of New Zealand, Sheet I., No. 2,525; scale, $m = 0{\cdot}25$ inch.

PANDORA BANK lies S. by W. ½ W. 6 miles from cape Maria Van Diemen lighthouse. Five fathoms is the least water found on this hard sand-bank, but the sea generally breaks on it. Immediately seaward is a depth of 20 fathoms, deepening rapidly to the westward, and 13 fathoms between the bank and the cape.

CAPE REINGA lies N.N.E. 3½ miles from the lighthouse; off it Columbia reef extends 2 miles to the westward, and is constantly breaking. Coasting vessels occasionally pass within this reef.

From cape Reinga to Hooper point is E. by N. ½ N. 10 miles; the coast for the first 6 miles being steep and cliffy, with hills rising to 800 or 900 feet above the sea, terminating in a sandy beach called Spirits bay, of which Hooper point forms the eastern extreme; this is a cliffy point, with a rocky islet lying close off it, the land immediately over being 1,000 feet high. The coast hence to the North cape is rocky, alternating with sandy bays, and its general aspect is that of steep cliffs, undermined by the sea, with table-land summits.

TOM BOWLINE BAY lies 6 miles eastward of Hooper point; it is the northern beach of the sandy neck which connects the North cape with the mainland; whalers have found a temporary anchorage here, but it is very open and exposed.

NORTH CAPE, which is bold cliffy table-land, trends E.S.E. 2½ miles from one and a quarter miles north-east of Tom Bowline bay, and terminates in its highest part, over the pitch of the cape, at a height of 790 feet. A small peaked islet lies off its eastern extreme, connected by a ledge of rocks; and foul ground extends N.E. by E. from the islet one-third of a mile, with a rock, only uncovered at low water, at its extremity. This northern extreme of the island is a peninsula, connected with the southern portion by a sandy neck 30 miles long, and about 6 miles wide; a range of white sand hills, from 100 to 300 feet high, extends nearly its whole length.

The bays within or south of the North cape offer anchorage in 5 to 12 fathoms, in moderate westerly winds, but the back swell rounding the North cape would render them bad anchorages in strong breezes.

A site for a lighthouse has been reserved at the North cape.

PARENGA-RENGA HARBOUR.—From North cape islet the coast trends South 6 miles to Kohau or Coal point, a black water-worn bluff, by which the entrance is easily distinguished, the outer north point of Parenga-renga harbour; and which bears N.E. by N. from the inner north point of the river. Its southern point (Fox) is dazzling white sand, with low sand-hills extending along the coast towards mount Camel:*

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* *See* plan of Parenga-renga harbour, on Admiralty chart, No. 2,525; scale, $m = 2$ inches.

Parenga-renga is a bar harbour, and has a shoal sandy spit extending from either entrance point; the northern spit runs from Coal point south-eastward nearly one mile with 9 feet water on it; the southern spit extends from Fox point in an E. by N. direction, and has less than one fathom. The channel entrance lies between these spits, and is nearly one-quarter of a mile in width, with 15 feet at low water on the bar (which generally breaks) deepening to 5 fathoms within.

Directions.—To enter bring the outer extreme of Coal point to bear N.W., and when at a little more than one mile distant from it, the depth will be 10 fathoms; thence,—being guided from aloft—a vessel should steer West, or for the inner north entrance point, until a low sandy point on the south side of the river, 1½ miles within Fox point, is in line with Koti-kau, a cliffy point 20 feet high, nearly one mile beyond the low sandy point, bearing W.S.W.

Note.—The inner north entrance point is low and sandy, and difficult to recognise from seaward.

Anchorage.—This course will lead to an anchorage in 7 or 8 fathoms, 1¼ miles inside the entrance, close to Otehi point on the north shore; from this point the harbour branches into three creeks, the southernmost of which is the deepest.

Tides.—It is high water, full and change, in Parenga-renga harbour at 7h. 54m., rise 7 feet.

GREAT EXHIBITION BAY is a slightly curving sandy beach running S.S.E. ¾ E. 10½ miles from the south point of Parenga-renga, and terminating in a cliffy point named Paxton, just southward of which is a sandy bay of the same name one mile long. The soundings off this part of the coast are regular, there being from 12 to 16 fathoms sandy bottom at one and 2 miles off shore.

From Paxton point to Granville point the coast trends S.E. by E. ½ E., 6½ miles; immediately northward of the latter point is Henderson bay, a sandy beach 2 miles in extent; off this point also are Simmond's islands, bearing North respectively half a mile and one mile distant from it.

Granville point is the western point of the extensive bay of Rangaounou, which lies between it and cape Kara-kara, the north-west extreme of Doubtless bay.

South of Granville point is a sandy bay, one mile in extent, where anchorage may be had with off-shore winds in 9 fathoms, but preferable shelter is to be found in Ohora bay, a mile to the southward. Mount Camel, an isolated hill, 820 feet high, lies immediately over the southern side of Ohora bay. Between these bays are two rocks awash, lying one-quarter of a mile from the steep cliffy shore.

OHORA BAY is clear of dangers, and a snug anchorage, where a vessel may ride out any westerly gale varying from north to south, in 7 to 5 fathoms.*

Water.—Fresh water may be obtained, and abundance of fish.

Anchorage.—If on reaching the neighbourhood of the North cape from the southward, a vessel should meet with a north-west gale, instead of contending against it she might proceed to Ohora bay. Mount Camel is an excellent guide, being the only eminence of that height on the coast for many miles.

OHORA RIVER.—South-westward, nearly one mile from Ohora bay, is the river of the same name, which on the approach of a north-east gale, might be entered by vessels not drawing more than 15 feet water, by keeping the high land on the north shore on board within half a cable, on a West course, until a small round islet, Motu-otuna, 1¼ miles inside the entrance, is seen just opening to the left of Tokoroa islet, bearing W.N.W., which is the course in; vessels should moor well over on the north shore, soon after passing the south sandy point, with the summit of the mountain bearing N.E.

Caution.—The channel in is rendered very narrow by a sand spit, which runs half a mile south-eastward from the southern point; the space for anchorage is small, and the tides are rapid; the Ohora river should therefore be only run for under favourable circumstances, or on the approach of bad weather.

From Ohora river a nearly straight sandy beach, backed by low sand hills, trends E. by S. 7 miles, and terminates in the western sandy entrance point of Rangaounou or Awanui river.

CAPE KARA-KARA is the eastern point of Rangaounou bay; westward of it the Motu-roa islets extend for 3 miles. Deep channels exist through these islets, and between them and the main, with sunken rocks in them on which the sea only breaks occasionally; they should not therefore be attempted by strangers, nor indeed by any vessels but coasters.

South-west of cape Kara-kara is a sandy bay of the same name, 4 miles in extent, with 10 and 12 fathoms water across. On its south-western point is a flat-topped hill, Puheki, 300 feet high, which is a good guide to Rangaounou or Awanui river, being 2¼ miles eastward of its eastern head.

RANGAOUNOU BAY extends 12 miles from east to west, and is 6 miles deep; across its entrance there is a depth from 20 to 25 fathoms, and 10 fathoms within one mile of the shore; the river Rangaounou or Awanui lies in the depth of it.*

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* *See* plan of Ohora bay and river, on Admiralty chart, No. 2,525; scale, *m* = 3 inches.

Off Blackney point, the eastern head of this river, the Motu-tara rocks, above water, extend W. by N. ½ N., 3½ cables, beyond which, on the same bearing, two-thirds of a cable, is a rock awash at low water. This rock awash bears from the outer Motu-roa islet (which latter may be rounded close) S. by W. ½ W., 6¼ miles.

S.W. ½ S. 3 cables from Blackney point, is the north point of Raupo bay, whence the shore trends S.S.E. one mile to Te Kotiatia point, the inner east entrance point of the river; it has a flat-topped hill upon it, and rocky patches with 6 and 9 feet water extend off this point in all directions for one-third of a mile. A spit also extends N.W. by W. one mile from this point, with an average depth on it—from about 4 cables off the point—of 2½ fathoms, the eastern boundary of the channel.

At 1¼ miles to the westward of the western sandy point of the river, a sand spit, Te-puki-te-huri, on which there is usually a break, extends from the beach 1¾ miles in a northerly direction, having 13 feet on it at 1½ miles, and 3 fathoms at its extremity. The outer point of this spit bears W. by S. from the outer Motu-tara, 7 cables distant, with a channel between of 7 fathoms.

Directions.—Vessels entering Rangaounou river should pass 2 cables outside Motu-tara rocks, to avoid the sunken rock outside those seen dry; then steer S. by W. ¼ W. (shoaling from 7 to 3½ fathoms), not shutting in point Blackney until the peak near the extremity of the range extending south-eastward of Te Kotiatia is open of the point, which clears the north-west end of the eastern spit. When Te Kotiatia point bears E. ½ S., immediately haul up S.E. by E. ½ E., and pass within half a mile from it.

Vessels of light draught can cross the eastern spit in from 2¼ to 2½ fathoms, passing Te Kotiatia at the distance of 4 cables.

Anchorage.—When Te Kotiatia is in line with the points north of it, anchor in 5 to 7 fathoms, half a mile above the point. Half a mile above this anchorage the flats and narrow channels commence, but coasters may go 9 miles up.

Tides.—It is high water, full and change, in Rangaounou or Awanui river at 7h. 44m.; rise 7 feet.

MATAI BAY.—South-east of cape Kara-kara, 5 miles distant, is Knuckle point, the western point of Doubtless bay. Matai bay, midway between, is divided by a narrow peninsula into two inner bays, Ohunga-

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* *See* Admiralty plan of Rangaounou or Awanui river, No. 2,520; scale, *m* = 3 inches.

[illegible] and Wainui: the western, [illegible], has the best anchorage, in 5 fathoms and [illegible] bottom: the eastern, Wainui, is full of rocks: in it is the native village of [illegible], where fresh water and supplies may be obtained: the hills rising behind this village are remarkably red, and will point out Matai bay.

Rock.—The only danger in entering Matai bay is a rock in mid-entrance, just covered at high water, which has 12 fathoms round it, and lies a little more than one mile N.N.E. ½ E. from [illegible] point: with north-east winds the bay is an unsafe anchorage.

ORURUA BAY.—This small bay is immediately north-west of Knuckle point, with a rock in its entrance, bearing N.N.W. little more than half a mile from the point.

DOUBTLESS BAY is 5½ miles wide at its entrance and 5 miles in depth; its north-east point, Flat head, which has a flat-topped islet lying immediately off it, bears from Knuckle point S.E. by E. ¼ E. 6 miles distant. A depth of more than 30 fathoms will be found across the mouth of Doubtless bay. When 4 miles within the entrance the bay opens out to a width of 9 miles, and has a sandy beach of 7 miles in extent on its western side; Monganui harbour is in the south-east corner, distant from Flat head islet nearly 5 miles.

Albert rocks.—The only dangers on its eastern side are the Albert rocks and Fairway reef. The former are two rocks nearly 2 cables apart, well out of water, with 10 fathoms between them; they lie S.W. by W. ¼ W. 2½ miles from Flat head islet.

Fairway reef is nearly one-third of a mile in extent, partly above water and partly awash; it lies S.W. ½ W. 4 miles from Flat head islet, and 1½ miles S.W. ½ S. from the Albert rocks.

Between these dangers and the eastern shore of the bay, is a channel of more than a mile in width, which vessels bound to Monganui harbour from the eastward, always adopt.

MONGANUI HARBOUR is more adapted for small than for large vessels, although it has afforded shelter for several whale ships together; it is 1½ cables wide at the entrance, and carries an average width of 2 cables for nearly three-quarters of a mile in a south-east direction; it then expands into extensive mud flats, nearly dry at low-water, leaving a boat channel on either shore for 1½ miles round Government island, which lies at the head of the harbour; at the back of this island the land is low and swampy, with mangrove flats.*

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* See Admiralty plan, No. 1,791, by Mr. Halloran, R.N., 1845; scale, m = 10·0 inches. Monganui harbour is much frequented by vessels engaged in the whaling trade on the coast, and from its proximity to their whaling grounds, is more convenient than Korora-

Anchorage.—The least depth in the fairway between the heads at low water is 4 fathoms, and they may be passed within fifty yards. Large vessels must anchor in the centre of the stream, and should moor; 4 fathoms will be found 3 cables within the heads, the water then shoals to 3 fathoms, and deepens again immediately on passing some rocks above water off the north shore, little more than half a mile inside the north head and about one cable off Butler point. A sunken rock with about 8 feet on it at low water lies close off their outer end. These rocks narrow the width of the channel to 1¼ cables; above them is the best and most sheltered anchorage for a vessel going to make any stay; she should drop her anchor in 4½ fathoms just after passing the rocks, and moor: 2 cables above them the water shoals very suddenly. Coasters may lie in 10 feet at low water abreast White point. The signal-staff is on Gibraltar point, about half a mile within the south head on that side of the harbour. The wharf is just above White point.

There is good anchorage outside the harbour in 6 and 7 fathoms in moderate weather.

Monganui has steam communication weekly with Auckland, with which it is connected by telegraph. Its chief export is timber. The population of the town in 1878 was 123.

Tides.—It is high water, full and change, in Monganui harbour at 8h. 15m.; the range of tide from 5 to 7 feet; the tides run in the harbour from 2 to 3 knots, and with north-west winds a swell sets into the entrance.

The best time to leave Monganui harbour is early in the morning, when there is generally a land wind or a calm; in the latter case a vessel may easily tow out with her boats; the tides must of course be attended to in entering or leaving.

Coal.—In a sandy bay immediately westward of the harbour, coal is found in seams, but it is of very inferior quality.

Rock.—There is a rock above water a quarter of a mile off the west point of this bay, one mile from the harbour's mouth; and on either side of it, east and west, at the distance of nearly 2 cables, is a rock awash at low water.

Taipa river.—Three miles westward of Monganui harbour is Taipa river, navigable a short distance for large boats; it has 5 feet

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rika. The depth of water in the middle of the harbour is less by 2 feet than shown on the chart by Mr. Halloran. Supplies of meat and vegetables can be obtained here. A new settlement has been formed in the neighbourhood, which will better enable them to meet the demand; water can also be obtained. Remark book of Captain C. H. Vernon, R.N., H.M.S. *Iris*. 1860–1861.

at the entrance at low water: off the mouth there is a rock above water with 3 fathoms on either side of it. One mile westward of Taipa river is a small rocky peninsula, and then commences the long sandy beach which extends round Doubtless bay.

FLAT HEAD.—From Flat head islet the coast trends E. ¼ S., 7 miles, to the western head of Wangaroa bay. One mile south-east of Flat head islet two high rocks lie close off the coast, and a bay runs in for some distance, but with no sheltered anchorage: the coast is bold and cliffy. North-west of the west head of Wangaroa bay, a quarter of a mile off shore, is Cone rock, which is high, and a smaller one out of water near it, with 17 fathoms close outside them; and in a bay 2 miles to the westward is a small high sugar-loaf islet, nearly a mile from the shore; there are no dangers about these rocks, but what are visible.

WANGAROA HARBOUR and BAY.[*]—The entrance to Wangaroa harbour lies from the west head of Wangaroa bay S.E. by E. 4 miles; an excellent mark for this harbour is Stephenson island (*Mahinepua*), which lies in a north-west and south-east direction, is 1½ miles in length, and half a mile in width at its southern end; the south-east extreme bears from the entrance of the harbour N. by E. ¾ E. 2½ miles: it is high, and tapers away gradually towards its north-west extreme, where it is nearly divided; it has two bays on its western side, and off the south-west point are two rocks out of water.[†]

Anchorage.—Stephenson island affords considerable shelter to Wangaroa bay; anchorage can be obtained in 9 and 11 fathoms anywhere between it and the shore, and good shelter with any winds that would prevent a vessel entering the harbour. The land about the entrance of Wangaroa harbour is high, with steep cliffy shores, particularly on the western side.

False head, a remarkable straight bluff, is one mile westward of the entrance, and has two or three high rocks standing off it.

Directions.—The entrance to the harbour is through a narrow channel, one-third of a mile in length, in a north-east and south-west direction, the least width being about 250 yards: the shores are high and steep-to on either side, and may be approached boldly, there being 9 and 10 fathoms close to the cliffs. There is a beacon painted white on the south head, erected to guide strangers to the entrance. The tides in the entrance run from 2 to 3 knots, and the wind is always baffling, unless blowing directly in or out; small vessels may easily work through with the tide, but the sea breeze, which is generally regular, blows directly through the passage, and large vessels should wait at anchor outside for it.

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[*] *See* Admiralty plan, Wangaroa bay, No. 1,092; scale, m = 3·0 inches.

[†] Mr. Dennis, master of barque *Royal Diadem*, reported in 1875 the existence of a rock rather close in shore, about 1½ miles S.W. from the west head of Wangaroa bay, and which breaks with but very little swell on: the position, however, is doubtful.

Wangaroa is an excellent harbour when inside: the average width of its main branch, which runs in for more than 2 miles, is about one-third of a mile; there are three bays on the eastern side which afford good anchorage, nearly out of the tide, the two outer ones in 6 and 7 fathoms: the most convenient anchorage, however, is in Kaouou bay on the western side of the harbour, immediately inside the entrance.

Kaouou bay.—There are two rocks in this bay nearly awash at high water; they are a cable apart, with 9 fathoms between and deep water all around: the outer one bears from the inner western entrance point, which is a small rocky peninsula, W. by S. ¾ S., nearly 4 cables; and from Middle head, which is the south head of Kaouou bay, N.W. by N., the same distance.

Directions.—These rocks may be passed on either side; but it is recommended, after passing the rocky peninsula just mentioned, to steer to pass on their south side half a cable, anchoring in 5 fathoms, 2 cables above them.

Anchorage.—This will be found an excellent anchorage, quite out of the tide, and free from the eddies and irregular tides which prevail in almost every other part of the harbour, and which, together with the baffling winds, render the entrance to the bays on the eastern side frequently difficult and tedious for a sailing vessel.

Caution.—A shoal sand-patch of 15 feet extends off Middle head, nearly 2 cables to the northward, but there is plenty of room for the largest ships between it and the two rocks described. H.M.S. *Havannah*, and several other of H.M. ships, have anchored in this bay; a vessel may anchor outside the two rocks, if convenient, in 7 or 8 fathoms, but she will scarcely be out of the influence of the tide or a swell which generally sets in through the entrance with a strong north-east wind.

Vessels leaving Wangaroa harbour should choose the early morning, as there is generally a light land wind or calm at that time; in the latter case no difficulty will be found, if the boats are ahead, to keep the ship's head in the proper direction, taking advantage of the tide.

The land round the harbour, except at the head, is high and steep; deep fissures penetrate the coast, and high cubical masses of rock are piled one above the other to a height of several hundred feet; this is particularly the case at the head of Kaouou bay.

Peach island, a high remarkable looking island, lies in the centre of the harbour half a mile from the entrance, at the entrance of Owanga bay on the east side; there is deep water all round it.

The most remarkable objects in this singular harbour are two cupola-shaped hills, mounts St. Peter and St. Paul; they lie on opposite sides of the harbour, 2 miles from the entrance. St. Paul, on the eastern shore, is a striking feature, resembling the dome of that cathedral, hence its name; the water at the head of the harbour, within the line of these hills, is shallow, and mud-flats dry for one mile off the shores.

Several tide creeks among mangrove bushes, extend for some distance inland, navigable for boats and leading to the kauri forests.

Mission.—On the west side, at the head of the harbour, is the French Roman Catholic mission establishment.

Vegetables and fruit, including grapes, peaches, &c. are cultivated here to a considerable extent, and with much success; fresh water may be had from the streams in any of the bays.

The chief export of Wangaroa is timber, and coal has also been found in the district. It has weekly steam communication with Auckland. Population in 1878, 201.

West bay.—Independent of the anchorage which may be obtained outside the heads, by vessels waiting to enter or for other causes, shelter from westerly winds will be found in West bay, lying one mile to the westward of False head, one-third of a mile off the sandy beach in 5 fathoms; within that distance the water is shallow. There is another sandy bight one mile to the north-west of it, with Kava islet, a flat rock 2 cables off shore, having a depth of 5 and 6 fathoms between.

Eastward of the entrance of Wangaroa harbour 1¼ miles, is a small river navigable for boats; off its west sandy point, a reef of rocks out of water, extends a quarter of a mile: nearly one mile farther eastward are the Arrow rocks high out of water, with straggling rocks around them; they extend in a north-west direction half a mile from the shore, and should be given a berth of the same distance, as the tides sweep with some strength between Stephenson island and the main: nearly one mile again eastward is the eastern point of Wangaroa bay, with an islet lying close off it.

Tides.—It is high water, full and change, in Wangaroa harbour at 8h. 15m.; springs range 7 feet. The flood stream on the coast sets to the westward, and the ebb to the eastward.

FLAT ISLAND is a low bare island, nearly 4 miles East from Stephenson island, lying immediately off the eastern point of East bay; it is half a mile in length from north to south, and although its outer extreme has the appearance of a shelving point, it may be passed within 2 cables in 20 fathoms.

CAVALLI ISLANDS.—Eastward of Flat island, 4 miles distant, is an extensive group of small islands, occupying a space of nearly 5 miles from north to south, and more than 2 miles from east to west.

The centre island or great Cavalli, is nearly 2 miles in length north and south, and one mile from east to west; around its north-west and east sides, within a radius of 1¼ miles, are dispersed ten small islets, high, and having several rocks scattered among them, particularly on the east side; there are depths of 20 fathoms half a mile outside this group; off the western side of the Great island, a quarter of a mile distant, is a rock high above water.*

The island next in size lies a mile south-east of great Cavalli; it is a very remarkable steep rocky island, one mile long east and west; its summit rises in regular steps, and from this circumstance it has been called Step island; between it and great Cavalli is a cluster of rocks above water, and one sunken, with no safe passage between.

Tides.—It is high water, full and change, at the Cavalli islands at 8h. 0m.; springs rise 7 feet.

Cavalli passage is the channel between this group and the mainland: in its narrowest part, which is abreast Step island, the width is more than half a mile, and the least depth 17 feet at low water. In the centre of the channel, between great Cavalli and the mainland, is a sunken rock with about 6 feet on it at low water, which only breaks in strong winds from N.W. to N.E. This rock lies from the south-west end of great Cavalli, S.S.W. half a mile, and the same distance from the mainland, and may be passed on either side in 6 and 7 fathoms: this is a safe passage for small vessels, and coasters always take it.

In fine weather, anchorage may be had for small vessels in the sandy bay on the south side of great Cavalli, sheltered by some rocks which extend off its western point; and also in Matauri bay on the mainland immediately westward of Step island.

TAKO BAY.—From here the coast trends south-east round Tako bay 8 miles to Ngatoka Rarangui point, which has a high Nipple hill rising over it; and three rocks, the Needles, lying a short distance to the westward of the point, and at nearly one mile, is a small islet. There are no dangers in Tako bay, except a rock out of water 4 miles westward of the point, half a mile off shore, neither is there any sheltered anchorage; at the distance of one mile off shore are 13 and 14 fathoms. S.E. by S.,

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* A sunken rock has been reported to lie about one mile E.N.E. from the north-eastern Cavalli island.

3½ miles from Ngatoka Rarangui point, is cape Wiwiki, the western cape of the Bay of Islands.

BAY of ISLANDS.—This extensive bay or gulf is comprised between capes Wiwiki and Brett, and is nearly 10 miles wide at its entrance; a peninsula 3 miles in length, extending in a north-west direction from about the centre of the bay, may be said to divide it into two distinct portions.*

In the western, are port Tepuna and Keri-keri river; farther south, and on the western side of the peninsula just mentioned, is port Russell (*Kororarika*), the principal and best known anchorage, with a flagstaff erected on the hill which overlooks it; and above this bay again the rivers Kaua-kaua and Waikari, which run for a considerable distance to the southward and eastward; the eastern branch communicating within a short distance of the harbour of Wangaruru, on the east coast. In the eastern portion of the bay, are the numerous islands from which its name is derived; these, together with the peninsulas that cut up its southern coast, afford many good and secure anchorages.

The depth of water within the line of the outer capes does not exceed 40 fathoms, and there are few dangers that do not show themselves.

The western portion of this extensive bay, commencing at cape Wiwiki, will be the first described.

CAPE WIWIKI.—This cape, which forms the western entrance point of the bay, is a steep bold headland, its summit, mount Pocock, being 843 feet high; it is a dark coloured hill rising abruptly on its northern and eastern sides, with the southern slopes well wooded nearly to the summit.

Galakek island is a small island of moderate height, immediately off cape Wiwiki, scarcely half a cable distant, with a rock above water, a cable north of its eastern end.

The Nine-pin (*Tiki-tiki*), a high black pinnacle rock, lies half a mile north-east of this island, with a passage between 3 cables in width, and 12 fathoms water; this isolated and very remarkable rock is an excellent guide for a stranger, and may be distinctly seen from a distance of 12 miles.

One mile southward of cape Wiwiki is Howe point, and midway from the coast between them, and connected with it by a low neck, projects a high round-topped cliffy peninsula. Between Howe point and the island Motu-roa, situated 2 miles southward, is the passage to the western anchorages of port Tepuna and Keri-keri river.

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* *See* Admiralty chart, Bay of Islands, No. 1,090; scale, *m* = 2·0 inches.

Motu-roa is a long narrow island, lying in an east and west direction, and extending off Toké-toké point on the mainland, 1¾ miles; it is 220 feet high, and the channel known as Kent passage, between its western extreme and the point, is 2 cables wide with 7 feet at low water.

Black rocks.—Off the northern and eastern ends of Motu-roa lie the Black rocks, so called from their colour; they are a remarkable group of smooth flat-topped rocks, about 15 feet high, steep, and with no dangers about them.

Tepuna or Rangihoua bay.—S.W. from Howe point, one-quarter of a mile, is a small rock above water; and 1½ miles westward of the point is Tepuna or Rangihoua bay; here the first missionary station was established in New Zealand, and there are still the houses of settlers; there is anchorage in this bay in 5 and 6 fathoms, sandy bottom, but it is open to easterly winds.

Tepahi islands.—Immediately westward of Rangihoua bay are the Tepahi islands, four ragged-looking islands, with shoal water between: a round rock, well out of water and nearly 2 cables in circumference, lies half a mile to the eastward of them; and between this rock and the west point of Rangihoua bay, a quarter of a mile from either, is a sunken rock which breaks at low water.

Porae-nui point, three-quarters of a mile south-west of the Tepahi islands, is a long projecting point with an isolated hummock on its extreme, on which stands a remarkable tree: this point, 3 miles south-west of Howe point, is the northern entrance point to the western anchorages; Toké-toké point, which bears from it S.S.E. one mile, and has a white sandy beach at its extreme, forming the southern.

From Howe point to this entrance there is a good working channel of nearly one mile in width in the narrowest part: the Tepahi islands on the north shore and the Black rocks on the south, may be approached close, and there is anchorage between them, if necessary, in 9 fathoms.

Onslow or Howe rock.—The only danger to be avoided is the Onslow or Howe rock, which lies in the outer entrance, between Howe point and the Black rocks: it has 17 feet on it at low water, and is a perfect pinnacle, with 15 fathoms close to. This rock lies S.S.E. seven-tenths of a mile from Howe point; when on it, the extreme of the projecting peninsula, midway between that point and cape Wiwiki, is in a line with the low western neck of Galakek island, N. ½ W., and the extreme of Porae-nui point bearing S.W. by W. ½ W., is seen just northward of Cocked Hat island, a low triangular shaped island, three-quarters of a mile beyond it.

Directions.—There is a passage nearly three-quarters of a mile wide between Howe point and this rock, with 16 fathoms water, and the point may be passed as close as is convenient; for a mid-channel course between, bring the outer extreme of the south-west or outer Tepahi island, in line with the hummock on Porae-nui point, and steer for them until Howe point is on with the Nine-pin, when a vessel will be well to the westward of Onslow rock.

If it is intended to pass to the southward, between it and Black rocks, the west end of Galakek island should be kept open of the peninsula before mentioned, until the south extreme of the outer Tepahi island bears W. by S.; this will lead a quarter of a mile southward of the rock, and a course may be steered up the passage for Porae-nui point.

When abreast Porae-nui point, port Tepuna runs to the W.N.W., its entrance being between it and Middle point, which is W. by S., three-quarters of a mile from Porae-nui; the Keri-keri river taking a westerly direction, and having the low stony triangular Cocked Hat island lying in the centre of its entrance.

The Brothers, and Slains Castle rocks are between Porae-nui point and Cocked Hat island, rendering the approach with a working wind somewhat difficult for large vessels; the Brothers are two rocks more than half a cable apart, awash or breaking, and are consequently easily avoided; they lie S. by W. from Porae-nui point, the northernmost rock being 2 cables distant from it, with a 17-feet rocky patch extending half a cable to the northward.

The Slains Castle rock is sunken and dangerous; it lies W. ¾ N. 3 cables from the centre of the Brothers, in a line between them and Middle point, and S.W. by W. ½ W., 4 miles from Porae-nui point, in a line between it and the north end of Cocked Hat island; it is more than half a cable in extent, and the least depth on it is 8 feet at low water.

Directions.—Vessels entering port Tepuna from the eastward, with a leading wind, should pass between Porae-nui point and the north Brother, half a cable from the point in 5 fathoms; and by steering to the northward of Middle point, Slains Castle rock will be avoided; between the Brothers rocks and Slains Castle rock there is a passage 2 cables broad, but it is not advisable for a large vessel to take it.

The widest channel, which is 4 cables broad, is between Slains Castle rock and Middle point; vessels entering port Tepuna or Keri-keri river by this channel, should pass to the southward of the south Brother rock about a cable, and when abreast of it steer West, or for the first point on the north shore of Keri-keri river above Middle point, which is a short half-mile from it, and will be readily known, being a small high rocky peninsula;

when Middle point bears N.W. ½ W. the rock is well passed, and a vessel may haul up N.N.W. for port Tepuna, or continue her course for Keri-keri river; in the latter case, she must anchor about half a mile above the peninsula point just mentioned, in 5 or 6 fathoms mud, off the mouth of a deep cove; above this cove the water shoals rapidly. There is a 16-feet rocky patch, extending 1½ cables north-eastward of the eastern low point of Cocked Hat island, but the West course above given will clear it well.

Port Tepuna is a spacious and well-sheltered anchorage, though rather shallow for vessels of large tonnage to enter far; it is rather more than half a mile in width at the entrance, and a short distance within expands to a mile. At Separation point, 1¼ miles N.W. from the entrance, the harbour divides into two arms, the Poukourou river running to the northward 2 miles; and what is called Monganui river—but in reality only a creek terminating in a shallow round mangrove beach, 3 miles above Separation point,—continuing the direction of the main channel W.N.W.; both are shallow, carrying 6 feet at low water nearly to their heads.

Anchorage.—The deepest water in port Tepuna is on the southern shore, where there are 5 and 6 fathoms for half a mile above Middle point, 4 fathoms more than one mile above, and again for another mile, 3 fathoms at low water. There are also two snug bays 1½ and 2 miles above Middle point, where coasters may anchor in 12 feet at low water; off the point which separates these bays, three rocks above water extend a cable; fresh water is to be procured in streams at their heads.

On the north shore of port Tepuna the water is shoal for a short distance above Middle point; and from Pah point, a high point with the remains of a pah on it, 1¼ miles above Porae-nui point, rocky ground with 11 feet at low water, extends S. by W. half a mile, leaving a channel little more than 3 cables broad between its edge and the south shore; when Pah point bears N.E. by E., the shoal is cleared, and there are 3½ fathoms close up to the point.

Rock.—A rock awash at low water lies W. by S., 4½ cables, from Separation point, and one mile above the point are two patches of rocks always out of water.

River Keri-keri, although apparently an extensive sheet of water, is only navigable for boats above the anchorage before mentioned, that is, three-quarters of a mile above Cocked Hat island, and 1½ cables from the north shore, in 5 fathoms mud; there is no channel southward of the island, and at low water extensive flats and large stony patches are uncovered; boats can go 5 miles above the entrance, when further navigation is stopped by the falls; at low water the best boat channel is along the north shore.

Anchorage.—Coasters pass through the Kent passage; and in the bay to the westward, between it and Cocked Hat island, there is anchorage in 7 fathoms.

Tapeka point.—From the easternmost Black rock, Tapeka point—the northern extreme of the Kororarika peninsula—bears S.S.E. nearly 2 miles; several detached rocks well out of water, and on which there is generally a break, extend for nearly a quarter of a mile from it; they are all visible, and may be passed within half a cable in 6 fathoms.

Between Tapeka and Manawaroroa points, which latter is directly West of the former, 1¾ miles distant, is the entrance to port Russell (*Kororarika*) and the southern anchorages; this entrance, however, is contracted to little more than half that width by the Brampton or Favourite bank, which extends more than three-quarters of a mile off Manawaroroa point.

Manawaroroa point, or more properly speaking flat, for it occupies an extent of three-quarters of a mile north and south, is a low and shelving projection composed of rocks and swampy ground, which dries a quarter of a mile from the shore at low water.

Brampton or Favourite bank.—The southern limit of this bank commences at the south point of Hume creek, which is 3 cables south-east of the southern part of Manawaroroa, and its northern at more than half a mile from the north end of the flat; thus its base occupies an extent of 1½ miles, and the bank terminates in a point three-quarters of a mile eastward of the centre part of it from low-water mark. The depth of water is from 6 to 15 feet, and it shoals suddenly from 5 fathoms to the latter depth; in strong northerly or easterly winds the sea breaks heavily on it, with a long rolling surf; this bank offers no difficulties whatever in entering or leaving the port with a leading wind, as there is a clear channel of three-quarters of a mile in the narrowest part between it and Tapeka point.

The outer extreme of the easternmost Black rock, in line with the Ninepin, N. ¾ E., leads directly over the tail of the bank, and the same extreme of Black rock in line with the outer extreme of Galakek island, clears it 1½ cables in 6 fathoms.

Buoy.—A red buoy marks the eastern extreme of this bank.

PORT RUSSELL (KORORARIKA BAY) and ANCHORAGE.—A vessel entering with a leading wind should keep a quarter of a mile outside the rocks off Tapeka point,—as also the point next to it,—and Kororarika point, as off these points, rocks lie scattered above water; on passing the latter point, the town of Russell will open out, and the best anchorage is off the centre of the bay in 4½ fathoms mud, with Kororarika point bearing North, and the lamp-post on the outer end of Government wharf N.E. by E. ½ E.

Light.—A *red* light, 20 feet above high water, is exhibited from a lamp-post on the outer end of Government wharf, and in clear weather is seen from a distance of about 2 miles between the bearings, East to North.

The depth of water at the outer end of this wharf at low springs is 15 feet.

Observatory islet.—Off the south point of Kororarika bay is the small rocky islet Kairaro, or Observatory islet, it is 60 feet high. This islet can be advantageously used as a leading mark to clear Brampton bank.

Directions.—Working up for the anchorage off Russell, a vessel may stand to the westward towards Brampton bank without fear until Observatory islet is just open to the southward of Kororarika point, when she will be in not less than 6 fathoms, and must then tack; this turning mark will hold good until the outer rock off Tapeka point is in line with the south-west point of Motu-arohia, E.N.E. (Motu-arohia is the first island eastward of Tapeka point, distant nearly 2 miles); when these marks are on, then the clearing marks to the northward must be taken up; that is, the eastern extreme of the outer Black rock in line with the outer extreme of Galakek island, which will lead a vessel 1½ cables clear of Brampton bank in 6 fathoms.

Hermione rock is another danger which must be avoided in working up; it is a patch with 2 feet water on it at low springs, and which very rarely breaks; from it Mr. Busby's house, a prominent object on the north side of Waitangi river, bears S.W. by W., and it lies from the north end of Motu-mea, N.W. by N. half a mile; from Kororarika point, S.W. by W. ½ W. 1$\frac{1}{10}$ miles, and off shore 4 cables. The marks which clear Brampton bank lead very close to this rock; the outer Black rock must, therefore, not be brought outside, or to the eastward of the centre of Galakek island, when approaching Hermione rock.

Motu-mea, a narrow island, one-third of a mile in length, lies on Waitangi river entrance; it is nearly connected with the mainland by a ridge extending from its southern extreme, nearly dry at low water, but having a boat channel close to the shore; it has also shoal water, extending more than a cable to the eastward, and a reef of rocks 1½ cables off its north end, the outer ones of which are covered. An islet, distant a cable, lies off its S.E. point.

Tides.—It is high water, full and change, at Motu-mea at 7h. 15m.; springs rise 9 feet, neaps 6 feet.

Waitangi river is S.W. 1½ miles from Kororarika point; small vessels enter this river, and can proceed a very short distance up. They must either pass between Hermione rock and the shore in 3½ fathoms, or between the rock and Motu-mea; in the latter case, Mr. Busby's house in line with a remarkable one-tree hill, 1¾ miles westward of the house inland, leads between in mid-channel in 3 fathoms, when the river may be steered for. A store-house stands on the north point, and from the latter a boulder spit runs half a cable dry at low water; 5 feet is the least water at the entrance at low springs, and 12 feet inside; with strong north-east winds a swell sets into the river.

Water.—Excellent water can be obtained from the Waitangi falls. In 1878, the launch, 8½ tons, of H.M.S. *Wolverene* was filled in 20 minutes.

Paihia village (the Church mission station) is in a sandy bay southward of Motu-mea. There is no good anchorage in the bay, as the water shoals for a considerable distance, and it is exposed to northerly winds; the lights of Paihia village at night will be found a guide to clear Brampton shoal; when they are seen eastward of Motu-mea, a vessel is to the eastward of the tail of the bank; northward of Manawaroroa point, however, they would not be available, as a vessel may stand far enough to the westward to open them out westward of the island.

Motu-arahi or Paihia islet, lies about a cable off the south point of Paihia bay, and on the opposite shore is Toré-toré peninsula; the distance between these two points is 3½ cables, and they may be said to be the entrance points to the upper anchorages.

Toré-toré peninsula, 2 cables long in an east and west direction, is connected with the mainland by a narrow rocky neck, which at high water springs is covered; its extreme point is S. by W. ¼ W. one mile from Observatory islet. Pomaré bay, the deep bight running to the south-east between Russell and this peninsula, has from 10 to 16 feet in it at low-water.

Wahapu bay.—On the eastern shore above Toré-toré peninsula are two deep bights, Wahapu and Pipi-roa. The former, which is immediately round the peninsula, was formerly the military station of the district, and there is anchorage off the barracks for vessels drawing 8 feet. The latter is a shoal double bay, whose south point, Okiato, will be known by a large wooden house situated over it.

From Toré-toré to Tapu point the north entrance point of the rivers, or, more properly speaking, the inlets of Waikari and Kaua-kaua, is 1½ miles in a S.E. by S. direction, with a narrow but deep channel.

Two cables outside a line drawn from Toré-toré extreme to this point, is the limit of shoal water on the eastern side of the channel; its western edge is defined by a line drawn from the outer point of Motu-arahi to the point opposite Okiato; inside this line on the western shore, sand banks dry at low water, and the bank is very steep, shoaling suddenly from 7 fathoms to a few feet. This channel is nearly 2 cables wide, with a depth of from 6 to 9 fathoms, and the edges of the banks may generally be distinguished by the tide line.

Water.—On the western shore, immediately opposite Okiato point, is an excellent watering place, where it is *proposed* to erect a red beacon.

Waikari river.—Tapu point, the northern entrance point of the inlets, is a rounding flat-topped grassy point, of peninsular formation; the distance between it and Waimangaroa, the southern entrance point, being a quarter of a mile, with 11 fathoms water between; hence the Waikari turns to the eastward for 2½ miles, navigable for coasters, where there is a small island lying in the middle of the stream. From this island it runs E.S.E. 2 miles towards the harbour of Wangaruru on the east coast, and for that distance is navigable for boats. On entering Waikari river the small round islet of the same name will be seen on the southern shore off Pomaré's pah, E.S.E. half a mile from Tapu point.

Anchorage.—Ships may anchor a quarter of a mile above Waikari islet, in 5 fathoms, about a cable off the Pah point. Immediately eastward of this point, a deep bight runs to the southward for a mile, but within the line of its entrance points, is a depth of 3 feet only at low water

H.M.S. *Basilisk* in 1873, anchored in 10½ fathoms in Waikari river, for the purpose of obtaining coal off the mouth of the Kaua-kaua river, on the following bearings:—

Waikari island -	- E. by S. ¾ S.
Waimangaroa point	- S.W. by W.

The passage to this anchorage from port Russell is narrow and intricate for large ships, but the placing of several buoys has rendered the navigation easy.

Pilot.—A Government Pilot is stationed at port Russell.

Coal.—The coal mines in the bay of Islands are situated about 5 miles up the Kaua-kaua river. The coal obtained from these mines is of superior quality and excellent for steaming purposes, being regularly supplied to the Union Steam Ship Company—the principal shipowners in New Zealand,—as also the Royal Mail steam ships running between San Francisco, Auckland, and Sydney.*

The coal is brought alongside the ship in lighters holding from 80 to 100 tons. The price charged is twelve shillings per ton.

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* In 1873 the mines could not supply more than 120 tons per day, but as new machinery was in course of erection, a large increase was anticipated.

"The Kaua-kaua colliery is 120 miles from Auckland by water. This colliery has been at work since [illegible], and now produces about 50,000 tons of coal per annum. This quantity will be largely increased when the shipping facilities are improved by means of the extended line of railway to the deep water. The harbour is one of the best in the Colonies, and the navigation free from all obstructions up to the loading ground. The railway is now in course of construction, and will upon completion convey the coal to a wharf at which a depth of water of 40 feet will be obtained."*

Kaua-kaua river is very shallow and full of mud-banks, only available for small coasters at high tide. A short distance within its entrance between Waikari islet and Waimangaroa point, is a depth of 9 feet; whence it runs to the southward for 3 miles, and branches off to the south-east and south-west, and is lost in the mangrove swamps.

Bank off port Russell.—To the southward of a line from the south end of Kororarika bay, to Mr. Busby's house on the opposite shore at Waitangi, the water shoals to 3¼ fathoms; and there is also a middle bank, with 15 feet at low water, lying between Kororarika bay and Toré-toré point.

Buoy.—A black buoy marks the western extreme of this bank in 2¾ fathoms.

Directions.—A vessel bound above Russell, without touching there, and drawing more than 16 feet water, should pass Kcrorarika point at a distance of a quarter of a mile, and then steer S. by E. for the eastern end of Paihia islet (*Motu-arahi*) leaving the black buoy, marking the western extreme of the middle ground, on the port hand, until the north end of Motu-mea is in one with Mr. Busby's house, bearing W. by N. ½ N., which will not take her into less than 19 feet at low water; when these marks are on, steer S.S.E., or mid-channel between Toré-toré peninsula and Paihia islet, when the water will shortly deepen to 6 and 9 fathoms, which course will lead mid-channel nearly to Okiato point, when the shores are bold on either side.

A vessel of the same draught, leaving Kororarika (port Russell) for the upper anchorages, to avoid the 15-feet bank should steer for the south end of Motu-mea, leaving the before-mentioned buoy on the port side, until the north end of that island is in one with the store-house on the north entrance point of Waitangi river, bearing W. by S.; then steer the course as before directed, between Toré-toré peninsula and Paihia islet. A direct course from the anchorage at Russell for this entrance, leads over the outer part of the middle bank in 17 feet at low water.

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* Nautical Magazine, November 1880.

Kororarika or Russell is the only place in the bay of Islands at present of any commercial importance, and ships requiring supplies must proceed to this anchorage; a resident magistrate, as well as several European settlers, are established here. Vessels requiring refit may obtain almost any stores they may stand in need of, in addition to live stock, provisions, and refreshments. There is weekly communication with Auckland by steamers.

Water.—Water may be had from a stream at the north end of the bay, but not so good, and with less facility, than either at the stream above Toré-toré peninsula or the Waitangi falls.

Oysters abound on the rocks, below high-water mark, in all parts of the bay, except in the immediate neighbourhood of the settlements, and indeed on the whole extent of the east coast as far south as Auckland.

Numerous whaling vessels resorted to the bay of Islands for refreshments and supplies before the regular colonization of the islands, but since then their visits have declined considerably; the establishment of Customs' officers, and the prohibitory laws with regard to exchange with the natives, may be assigned as the chief causes.

The eastern portion of the bay of Islands, which has now to be described, is included between Tapeka point and cape Brett, a distance of 11 miles, in a N.E. by E. and S.W. by W. direction: the part, however, which is sheltered by the islands, and available for anchorage, extends only 6 miles eastward of Tapeka point, the remaining distance of 5 miles being a steep cliffy indented coast, without shelter as far as cape Brett.

The Rawiti.—The extensive sheet of water included between the islands and the mainland is called the Rawiti. The islands which constitute its northern boundary are six in number, besides several smaller islets and rocks; their greatest length, which is generally in a north-west and south-east direction, varying from three-quarters to 1¼ miles.

The southern shore of the mainland is cut up into deep and extensive bays and creeks, formed by the curiously-shaped peninsulas which are so characteristic a feature of New Zealand, and they afford excellent anchorages for vessels of moderate draught. The Rawiti itself is capable of containing and affording good shelter to any number of ships of the largest tonnage; still it is not without its shoals, and a due attention to the chart will be required to avoid them.

The western entrance, is between Tapeka point and Motu-arohia the western island, and is more than 1½ miles in width, with a depth of 14 fathoms.

The Eastern or Albert channel is between Orupukapuka the eastern island and Richards peninsula, its width being not more than a quarter of a mile. Small vessels rounding cape Brett with a scant wind from north-west avail themselves of this passage, as they can obtain anchorage when inside it, or work up in smooth water: vessels in distress have also entered under the same circumstances,—the *Hope* whaler, which struck on a reef on the west side of the channel (since named after her) ran through it into the Rawiti. This channel, however, is not fit for a large vessel; the ground is foul and irregular, and two 15-feet rocky patches lie in the centre of the entrance; there is also frequently a heavy swell setting into it.

Directions for Rawiti, Island passages.—There are two passages into the Rawiti, between the islands, which may be run for, if necessary, by observing the following directions:—Between Motu-arohia, a narrow island, a mile long, east and west, and Motu-rua, the island east of it, is a passage half a mile in width; in which is a rock always visible, lying 1½ cables off the south-west end of Motu-rua. Vessels entering the Rawiti by this channel should pass just westward of this rock in 7 fathoms, and, by keeping between a quarter and half a mile distant off the south-west side of Motu-rua, will not get less than 5 fathoms, which will shortly deepen to 9; and will also lead to the eastward of a small patch of 17 feet at low water, which lies nearly three-quarters of a mile S.W. of its south point, and will be noticed hereafter. Two steep cliffy islets and a large rock above water lie off the north-west end of Motu-rua, but they are free from danger.

Keke is the next island eastward of Motu-rua, a quarter of a mile distant; it is the smallest of the group, being seven-tenths of a mile long north-west and south-east, and one-quarter of a mile broad; there is no channel for a vessel between these two islands, and a small islet lying across the northern entrance narrows its width to one cable with only a few feet of water.

Orupukapuka, the largest and easternmost island of the group, lies half a mile eastward of Keke island; three rocks above water extend off its western point, and there are three sandy bays on the west side of the island with shoal water; its south-east extreme is the western entrance point of the eastern or Albert channel.

The islands Otawaki, and Okahi or Red island, lie W.N.W. of and in a line with Orupukapuka, having boat channels one cable wide between them. The northern side of Okahi (the northernmost of the group), is a red precipitous cliff with a round red summit known as Red head, which will be immediately recognized on rounding cape Brett; some rocky islets extend one cable off this head, and a little more than half a mile from it is Whale rock.

WHALE ROCK, marked by a large white buoy on its W.N.W. side, is the only danger in entering the bay of Islands from the eastward; this rock generally breaks at low springs, or when there is any sea. There is a clear passage 4 cables wide with 12 fathoms water between it and Red head, from which it bears N.W. by W. ¼ W. half a mile.

Second Island passage is between Okahi or Red island, and Keke. For one mile within Red island, or as far as the west end of Orupukapuka, is a channel half a mile in width, with 9 fathoms in the centre, and not less than 3½ fathoms close to the shore on either side. The western end of Orupukapuka, with the three rocks off it, narrows the channel to little more than 3 cables, when the water shoals to 4½ fathoms; after passing this point and half a mile distant from it, there is a belt 2 cables wide to be crossed, with 15 feet on it at low water, when a vessel will be fairly in the Rawiti in 7 fathoms.

Directions.—To enter this passage, a mid-channel course should be steered between the islands, S.E. ½ E. for 1½ miles, or direct for the western end of Poroporo island, until abreast of three large flat rocks off the south-east end of Keke island, pass the easternmost of these rocks at a distance of 1½ cables, and when it bears West there will be 15 feet at low water, on the northern edge of the belt. Steer then South for a quarter of a mile, when it will be passed; and if bound to the westward, a course may be steered accordingly; if to the eastward, or for any of the anchorages on the southern shore, it must be remembered that a shoal of 9 feet at low water, with a sunken rock (*see* page 57) almost awash at its extreme, extends half a mile S. ½ E. from the north-west end of Poroporo island. Vessels will scarcely have occasion to enter these Island passages unless with a leading wind, when both will be found easy.

A general description of the different channels which lead into the Rawiti from seaward having now been given, it will be necessary to point out the dangers to be avoided within, and to describe the anchorages on its southern shores, commencing from the westward. This extensive sheet of water, as has been before observed, has anchorage all over it; the general depth is from 6 to 9 fathoms, with good holding ground.

Capstan rock.—The first danger eastward of Tapeka point is Capstan rock (*Outou-rodi*). The natives assert that this rock was not long since awash, and that they have grounded their canoes on it to fish; in this case its head must have been washed off by the sea, which is not improbable, as the bottom in the shoal places is of coral formation; it is now a mere point, with a depth of 12 feet at low water, and 7 fathoms close round. The position of this rock is seven-tenths of a mile from the centre of Honiroa beach ; it bears from Tapeka point E. by S. 1¼ miles, and is exactly in a line between it and the east point (*Kakawera*) of Paroa bay. From the south-west end of Motu-arohia it is S. by W. ⅝ W. 1$\frac{1}{10}$ miles; and from the west point of Honiroa bay, N.E. by E. ¼ E. six-tenths of a mile.

Paroa bay is 2¾ miles eastward of Tapeka point ; it is half a mile wide at the entrance, runs to the south-east for one mile, and has 17 feet at low water just within the entrance points. This is a small vessel anchorage, and is not well protected from north-west winds ; the best shelter is in 9 feet at low water on the west side of the bay.

Manawara.—Immediately eastward of Paroa bay, and only separated from it by the narrow peninsula of the same name, is Manawara bay ; it runs to the south-eastward for 2 miles, terminating in Clendon cove, which has only 10 feet water a short distance within the entrance ; there are also two bays on its eastern side, in both of which there is anchorage for small vessels.

The entrance to Manawara bay is three-quarters of a mile wide, and is formed by two peninsulas ; that of Paroa on the western side, and on the eastern by the Native peninsula ; off the point of the latter is Bateman island, with rocks between and no passage. An extensive shoal extends from the western entrance point of Manawara bay to the north-west, or directly towards the sandy bay at the eastern end of Motu-arohia for a distance of one mile ; the least depth on it at low water is 12 feet, except one small patch of 6 feet, which lies S.W. ½ W. half a mile from the north-west end of Bateman island, or with the high summit of Mosquito point seen over the centre of that island bearing N.E. by E. ½ E. Vessels drawing not more than 11 feet, may avoid this patch by passing within a quarter of a mile of the west head of the bay, and can run into Manawara bay at any time of tide and anchor in either of the coves. Oraukaua, the north-eastern cove, is the best, and has 3¼ fathoms at low water well within it ; the middle cove has 14 feet within a reef of rocks which extends off its north shore ; and Clendon cove abreast its entrance point has 15 feet ; vessels of less draught can go higher up.

Directions.—A vessel drawing 17 feet may enter Manawara at low water by passing northward of the tail of the shoal, and taking the narrow passage on the eastern side of the bay, as follows :—coming from the westward, steer along the south side of Motu-arohia at a distance of half a mile, (a coral bank with 14 feet at low water extends more than a quarter of a mile south of its central part,) until its eastern end bears N.N.W. ½ W., then steer S.S.E. ½ E. to pass half a cable off the north-west low extreme of Bateman island; continue on this course for a distance of 4 cables after passing the extreme, or until the Knob, or north-west point of Oraukaua bay, is on with the sandy beach of Opuna cove bearing E. ½ N., when haul up to pass Knob point distant half a cable in 5 fathoms.

Anchorage.—As soon as the point is passed, haul in and anchor a quarter of a mile within it in 3½ fathoms at low water, or anchorage may be had in 5 fathoms nearly 3 cables south-east of Knob point if required, though not so well sheltered.

Directions.—In passing through the Rawiti to the eastward, the marks for clearing the tail of the shoal off Manawara bay are, to keep the islet point, which is nearly one mile eastward of Mosquito point, just open to the northward of it, which will lead one cable north of the shoal in 4 fathoms; when the east end of Motu-arohia bears N.N.W., the shoal, which has on its extreme 15 feet at low water, will be passed. Continuing a course E. by N. ½ N. to pass a convenient distance from Mosquito point which is bold close-to, the shoal patch of 17 feet at low water, and which lies nearly half a mile E. by S. from the east end of Motu-arohia, will also be avoided, that course leading southward of it nearly a quarter of a mile; there are 3½ fathoms between this patch and Motu-arohia; and for more than 1½ miles to the eastward there is a clear space free from all danger, with anchorage in from 7 to 8 fathoms.

Poroporo island.—The next danger to be avoided is the shoal, with a sunken rock at its extreme, southward of Poroporo island, and which has been noticed in describing the Second island passage; this shoal, which extends from both extremes of the island, has 9 feet at low water; the rock on its extreme end, bears from the north-west low point of the island S. ½ E., exactly half a mile distant. In steering to the eastward through the Rawiti, so long as the centre south point of Motu-arohia is not shut in by the eastern point of that island, a vessel will be well to the southward of this rock; the two points just touching, will lead 2 cables south of it in 7 fathoms. Steering on this line when the north-west low point of Poroporo island is in one with a double rock, lying off the centre point which separates the two large sandy bays on the west side of Orupukapuka island, bearing North, she will be abreast the rock; standing to the northward this mark leads directly on it.

Parekura is the next bay eastward of Manawara, being little more than 2 miles distant; its width at the entrance is 4 cables, with 6 fathoms between the points; it runs E.S.E. for 1½ miles, and there is anchorage in 4 fathoms half a mile within; and at another half mile is a depth of 9 feet at low water.

Waipero bay is a snug cove running to the south-west immediately inside the western entrance head of Parekura bay, where there is good anchorage in 15 feet at low water. The head of this cove is rather over half a mile of the eastern cove in Manawara bay, a high hill rising over the centre of the neck which divides them.

Makiwi cove.—Outside Long point, the eastern entrance point of Parekura, this sandy cove runs E.N.E. for half a mile; it is very shallow and unsheltered, and a reef of rocks, awash at half-tide, lies off its entrance W.S.W. nearly a quarter of a mile from the north point of the cove, which is a cliffy peninsula.

Caution.—Albert channel should never be attempted unless with a leading wind; small vessels may enter it under the conditions before mentioned, and may frequently with advantage pass to sea through it, if, as is often the case, they have been waiting wind-bound at any of the neighbouring anchorages; but it should not be taken without a steady breeze, in consequence of the swell that would set in after a strong northerly or north-east wind, and never by large vessels, unless in cases of emergency.

Two high cliffy islets, Round islet and Te Ao, lie off the south-west end of Orupukapuka, and two smaller ones with some rocks about them on the opposite shore; the bays within the latter to the eastward are shoal and rocky, and the islets must not be passed inside. These islets narrow the channel to one-quarter of a mile, and a patch of foul ground, with 13 feet at low water, lies south-east of Round islet, in the centre of the passage. In the entrance between the south-east point of Orupukapuka island and the west point of Richards' peninsula, is another small patch of 15 feet, which also lies exactly in the centre.

Hope reef lies from the western entrance point of the channel (the south-east end of Orupukapuka island) N. ½ W. half a mile, and is a very dangerous reef; it is one cable in extent, awash at low water, and the sea breaks heavily on it in bad weather. There is a 15-feet patch 2 cables eastward of it in the channel fairway, and another rock, which generally breaks, lies in a line between Hope reef and the Island point, 2 cables from the latter; immediately outside the reef are 14 and 15 fathoms.

Anchorage.—In a small sandy bay on the south-east side of Orupukapuka, immediately within the channel entrance, is good anchorage for small vessels in 12 and 14 feet at low water, well sheltered from northerly or westerly winds, but the island point must not be rounded very close, as some rocks extend a short distance from it.

Richards peninsula, nearly one mile in extent east and west, is moderately high, with a steep rocky islet lying off each of its three points, to the eastward, westward, and northward; they are scarcely detached from the coast, which is rugged and sea-beaten. This peninsula is connected with the mainland by a low sandy neck, about a hundred yards across.

Caution.—From here the coast curves to the N.N.E. for 2 miles to Deep-water cove, which from seaward would appear to offer shelter to a vessel; the water, however, is too deep for anchorage until within less than half a cable of the shore in the north-east cove at its head. Coasters have availed themselves of this cove when not able to work round cape Brett; but the bank is very steep, and an anchor would be liable to drag; it is half a mile wide at the entrance, and runs east for the same distance, a small islet lying off each point.

Twins rock, 13 feet above high water, and about a hundred yards in circumference, lies three-quarters of a mile north of the northern entrance point of Deep-water cove, and is 3 cables from the nearest part of the coast.

From Deep-water cove to Piercy islet off cape Brett is N.E. ½ N. 2½ miles, the shore steep and cliffy, with a swell generally setting on it.

Piercy islet is a high bare rock about 1½ cables in extent; it is perforated with a remarkable archway, and has a small rock off its south-east end; the islet lies about one-quarter of a mile N.N.E. of cape Brett, with deep water in the passage between. Steamers and coasters pass inside the islet.

Bird rock.—This black rock, more than half a cable in extent and about 25 feet above high water, lies W. ½ S. a little more than one mile from Piercy islet, with 40 fathoms water close-to.

Winds and weather.—During the spring and fall of the year, strong west and south-west winds prevail, at times blowing hard for a period of 3 or 4 days. During the summer months the sea breezes, which are from the north-east, are the prevailing winds, which towards sunset suddenly haul round to the southward and blow fresh. In the months of April and May strong gales from north to south-east are generally experienced, which cause the Brampton shoal to break heavily, particularly on the ebb with heavy freshes from the rivers. During the winter months, June, July, and August, dense fogs are prevalent after midnight, lasting till 9 and 10 a.m.

CAPE BRETT.—This cape forms the eastern entrance point of the bay. Its summit is 1,220 feet above the sea, the highest land in the neighbourhood, and is one mile S. by E. of the extreme point; it rises abruptly from the water on its eastern side, but slopes gradually to the northward, terminating at the extreme point in a round hillock about 300 feet high.

The eastern approach to the Bay of Islands is equally remarkable as the western; the high land of cape Brett cannot fail to be recognized from a long distance on any bearing.

Directions.—Vessels bound to the bay from the southward, with a fair wind and clear weather, may round Piercy islet at the distance of half a mile in 40 fathoms water; the course then will be W.S.W. 7 miles, which will lead a quarter of a mile outside Bird rock, and nearly one mile outside Whale rock; when the Island channel, between Red head and the islands westward of it, is open, Whale rock is passed, and a S.W. by S. course for 4½ miles will take a vessel mid-channel between Motu-roa island and Tapeka point: the directions already given for the harbour above these points will suffice.

Vessels arriving off cape Brett from the southward with a south-west wind, are recommended to stand direct across for cape Wiwiki and the Nine-pin, in preference to making short boards, as much smoother water will be found, and this wind frequently draws off the western shore and favours them, particularly towards the close of the day.

Tides within the Bay of Islands are not much felt, except at the narrow entrance of the rivers, where they run from one to 2½ knots per hour. In the Kawiti, one knot an hour is about their greatest strength, the flood running to the westward, and the ebb to the eastward.

It is high water, full and change, at port Russell at 7h. 15m.; rise of tide from 6 to 9 feet.

FROM CAPE BRETT TO AUCKLAND HARBOUR.

The inshore course and distance from a berth 2 miles abreast Piercy islet, cape Brett, into the Hauraki gulf is S.E. ½ S. 30 miles, which will lead 3½ miles off the Wide-berth islands (south point of Wangaruru bay); inside the Poor Knights rocks and Sugar-loaf, 3½ miles from the latter, and will take a vessel abreast Tutukaka harbour, at a distance of about 4½ miles.*

When abreast Tutukaka harbour, which will be known by three remarkable headlands called the three Gables, a course S. by E. ½ E. 23 miles, will lead midway between Bream head (*Tewara*) and the Chicken group, and to nearly abreast Sail rock (*Toutorou*).

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* *See* Admiralty coast charts of New Zealand, sheets I. and II., Nos. 2,525 and 2,543; scale, $m = 0 \cdot 3$ of an inch.

The course is then S.E. for 25 miles, midway between Toutorou and McGregor rock, to abreast Takatau point, 2 miles distant, having passed Rodney point within 1¼ miles. If it is intended to pass outside Flat rock, which, when abreast Takatau point, will be 5 miles distant, the same course will lead 2 miles clear of it; if inside, S. by E. ¼ E. will be about a middle course between it and Kawau island one mile distant from either, taking care to avoid Nelson rock, which lies half a mile off the south-eastern shore of Kawau. A vessel passing inside Flat rock will take the Wangaproa channel to Auckland harbour, which bears from the south-east end of Kawau island S. ¼ E. 9 miles.

Caution.—In giving these inshore courses, it must be understood by the seamen that they are only intended for vessels passing down the coast under favourable circumstances, and when everything can be plainly made out; they are the courses usually adopted by coasters, and by those acquainted with the navigation, when running for the Hauraki gulf or Auckland harbour, with a fair wind.

WANGAMOMOO HARBOUR.—From cape Brett the coast trends S. ¼ E. for 5 miles to the small harbour, Wangamomoo: the only danger between is a flat rock, 2 feet out of water, which lies under the summit of cape Brett 1¾ miles southward of Piercy islet, a quarter of a mile off shore.

Wangamomoo is the southern of two bays, somewhat similar in appearance when seen from seaward: the northern bay has several rocks scattered over it, and is without anchorage.

The north head of the harbour has an island lying directly east of it, and almost connected with the main; and southward of this head close-to, is a high bare islet; neither of these, however, will be made out at any great distance. The southern head will be easily distinguished; it is the extreme of a high peninsula, which projects more than half a mile further eastward than the north head.

The entrance is nearly half a mile wide, with 15 fathoms water; but to get secure anchorage a vessel must enter a small basin which runs to the south-west when three-quarters of a mile within the north head point, and the entrance to which is not 2 cables wide: it is a snug anchorage for small vessels in 5 or 6 fathoms.

Coast southward of Wangamomoo. — The peninsula which forms the southern side of Wangamomoo harbour, extends 1¼ miles eastward from the mainland, forming a bight on its southern side, which trends south-east to Home point, the northernmost point of Bland bay: this bight offers no shelter; there are some scattered rocks in its north-west corner, and a small islet lies S. ½ E. 1½ miles from the point of the peninsula, a quarter of a mile off shore.

Home point lies S.E. 4½ miles from the south head of Wangamomoo; it is a remarkable flat-topped point, and only connected with the main by a narrow neck; two rocky islets lie south of this point at distances of a half and three-quarters of a mile respectively; they are about one cable in extent and the same distance off shore.

BLAND BAY is immediately westward of these islets; it runs in a westerly direction for 1½ miles, and has a long sandy beach on its south-west side, which is the northern side of the sandy neck, [illegible] cables across, separating it from Wangaruru harbour. This bay is three-quarters of a mile wide at its entrance; but a string of rocky islets extend from its south side—a short distance within the head, of which is an island—in a northerly direction, more than half-way across the bay. There are also two rocks in the centre of the entrance which break at low water, or when there is any swell; they bear from the southern rocky islet on the north side of the bay S.S.E. half a mile, and S. ¾ E. 1¼ miles, leaving a passage north of them 3 cables wide.

Caution.—The only shelter which this bay would afford from easterly winds is to the westward of the line of rocky islets just mentioned, and here there is not more than 2 fathoms water, so that, although it has a somewhat inviting appearance in fine weather, it is useless as an anchorage, and a vessel should not stand in within the line of the heads.

DANGER ROCK, a black pinnacle rock standing 8 or 10 feet out of water, lies immediately off Bland bay, one mile from the coast; it bears from Home point, S.E. 1½ miles; and from the north head of Wangaruru harbour (cape Home), N. ¾ E. 2½ miles; this rock is steep-to, and may be passed on either side, there being 24 fathoms within 2 cables.

From the south head of Bland bay to the entrance of Wangaruru harbour the coast is steep and bold, with no outlying dangers.

WANGARURU HARBOUR is S.S.E. 13 miles from cape Brett, and lies in the north-west corner of a bay 5 miles in length, of which cape Home is the north point, and the Wide-berth islands the southern limit; it is a good harbour for medium-sized vessels, well sheltered, and easy of access. It lies in a north-west and south-east direction, and is formed between the mainland and the high peninsula which separates it from Bland bay.*

Henry island, 1¾ cables in extent, lies in the entrance, and with the reef of rocks awash, which run off its southern end in the same direction for nearly a quarter of a mile, affords considerable protection from easterly winds; the north end of this island bears from cape Home S. ½ W. 4 cables.

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* See Admiralty plan, Wangaruru harbour, No. 2,024; scale, m = 1·2 inches.

Directions.—Vessels may enter the harbour on either side of Henry island:—the passage to the northward is narrow, being one-quarter of a mile wide, with a depth of 7 fathoms; after passing Henry island, the Black rocks will be seen on the starboard hand; they extend 3 cables S.E. by S. from Grove point, and nearly the same distance off shore for half a mile to the eastward of that point, with 4 fathoms half a cable from their southern extreme. Passing to the northward of Henry island the mid-channel course will be W. by S., or a little to the right of Rugged point, a remarkable long low rocky point, bearing from the centre of Henry island W. by S. nearly one mile. A large vessel should anchor in 6 fathoms, with the centre of Henry island bearing East, distant a long half mile, and Grove point in line with the extreme of Black rocks N.W. by N., 4 cables distant, and the extreme of Rugged point the same distance.

The passage south of Henry island is the widest and best. Vessels entering Wangaruru bay from the southward, after giving the Wide-berth islands a berth of 1½ miles, in 14 fathoms, should steer West, which will lead between Henry and Nops islands; they bear from each other S. by W. and N. by E. 1¼ miles distant. Nops island is little more than a quarter of a mile long, and has two summits, which when abreast give it the appearance of two islands; they are connected, however, by a narrow neck of sand. When mid-channel between Henry and Nops islands, steer N.W. ¾ N., or for Grove point, and anchor with the bearings already given.

Caution.—The reef which extends a quarter of a mile S. by W. from the south point of Henry island is awash; vessels therefore should not approach that point of the island within 3 cables, in 9 fathoms water; if in 7 fathoms they are too close.

Anchorage.—There is a more sheltered anchorage than the one just described, 1¼ miles above Rugged point, but the channel to it is narrow for vessels of large draught, as a bank with 15 feet at low water extends nearly half a mile westward of Grove point. Vessels desiring this anchorage, and drawing more than 14 feet, should, after passing Rugged point, steer to pass one cable outside the high islet which bears from Rugged point N.W. ½ W. half a mile, and is connected with the shore by a ledge dry at low water; when this islet bears South, one cable distant, steer N.N.W. or a little to the right of Hay island, which is 1½ miles distant. By observing these directions, a vessel will pass the narrows in 19 feet at low water, and almost immediately after passing the high islet the water will deepen to 4 fathoms; when abreast the northern end of

Sandy bay (on the left hand), where there is a small native settlement, anchor in 4 fathoms, about 3 cables off the western shore, with Grove point bearing E.S.E.; the bottom here is mud.

Coasters drawing 8 feet may go 1½ miles above this, when the river narrows to a quarter of a mile, and is too shoal for anything but boats; the channel is to the southward of Hay island; the only danger is a 4-feet rock, which lies from the north point of Settlement bay on the west shore N. by W. 2 cables, and from the south-west point of Hay island S.E. ½ S. nearly half a mile.*

Tides.—It is high water, full and change, in Wangaruru harbour at 7h. 10m.; springs rise 9 feet, and neaps 7 feet.

Anchorage.—A snug and sheltered anchorage for vessels drawing from 10 to 12 feet, can be obtained half a mile northward of Grove point, and about 3 cables off shore, in 16 feet at low water; there is a native settlement in the first bay north of the point, where supplies may be obtained from the natives; peaches and potatoes are in abundance.

Water.—Fresh water may be obtained from a stream in this bay, as well as from Settlement bay on the opposite shore.

Mimiwanga bay, in the south-east corner of Wangaruru bay, is one mile in width at its entrance, and the same in depth. It lies S.E. ½ E. 4 miles from Henry island, and is open to the northward. Coasters bound to the southward make a stopping place of this bay with southerly winds; the best anchorage is with the east point of the bay, a cliffy point with three rocks off it, bearing North about 4 cables distant. On the east side is a long sandy beach, off the south point of which N.W. ½ N. a quarter of a mile, is a rock awash at low water.

WIDE-BERTH ISLANDS are a cluster of high rocky islets lying in a N.N.E. and S.S.W. direction, and extending off the south head of Wangaruru bay; the outer or north-easternmost lies N.E. by E. ¾ E. from the south head 1½ miles distant, and the inner one is a quarter of a mile from the shore. Three reefs awash lie one mile to the southward of these islands, and bear from the outer islet from S.S.E. to S.S.W., covering a space of more than half a mile.

Caution.—These islands should generally be given a berth of 2 miles, unless with a commanding breeze, as there is a swell frequently setting on them, and the tides are liable to sweep a vessel too close in light winds and calms.

From Wide-berth islands to the north Gable, the coast trends S.E. ½ S.

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* A sunken rock is reported to exist at 3 cables south of the small islet which bears East 6 cables from Hay island; this, however, needs confirmation.

for nearly 11 miles; it is indented with several sandy bays, but without anchorages.

ELIZABETH REEF, on which a vessel of this name was wrecked, lies off this part of the coast; it is 6½ miles to the northward of the north head of Tutukaka harbour, and bears from the outer Wide-berth islet S.E. by S. 6 miles; it is half a mile in extent in every direction, and its outer edge lies one mile from the shore. The central part is awash at high water, and the sea always breaking on it; there is a narrow channel with 3 fathoms between it and the shore; 7 fathoms will be found close outside the reef, and 22 fathoms one mile distant.

FOUR ISLETS are nearly midway between the Wide-berth islands and Elizabeth reef, about a quarter of a mile off the coast, with 10 fathoms water one cable outside them. The southern islet is high and the largest, being about a quarter of a mile in extent; it bears from Elizabeth reef N.W. ½ W. 2 miles, and from the outer Wide-berth islet S.S.E. ¼ E. 4 miles; the other three islets lie about a mile to the north-west.

SANDY BAY is immediately south of Elizabeth reef; it is 3 miles in length and 1¼ miles in depth, with 6 and 8 fathoms water in it. A rock awash lies 1½ cables off the beach, one mile southward of the north head; smooth water may be had in 6 fathoms, sheltered by Elizabeth reef, and it would afford temporary anchorage for coasters in fine weather.

THREE GABLES are three remarkable gable-shaped headlands, lying in a N.N.W. ½ W. direction, nearly a mile apart from each other, having bays between, which are rocky and unsheltered; the southernmost gable forms the north head of Tutukaka harbour.

TUTUKAKA HARBOUR is 30 miles from cape Brett, and 13 miles from the south head of Wangaruru bay; it bears from the southern Poor Knight island S.W. ¾ S. 11 miles, and will be easily recognized by the three peculiar headlands just mentioned. It has always been a favourite coasting harbour, in consequence of its position with regard to Nongodo river (being only 1½ miles to the northward), whence many of the native exports are derived; this river being difficult of access, owing to its intricate entrance, Tutukaka has been resorted to instead; a good native path connects the two, the distance being about three-quarters of a mile.*

The North head of Tutukaka is nearly an island, being barely connected by a very narrow sandy neck, which the sea washes; what will appear as the south head in coming from the southward is a cliffy islet, extending from the coast 2½ cables, and almost joined to it by rocks; this islet bears from the north head S. by E. ½ E. six-tenths of a mile, and has two rocks lying off it in an E. by S. ½ S. direction; the outer rock is above water distant 2 cables; the inner rock breaks, and is mid-way between; there are 3 and 4 fathoms water between these rocks. Also another rock which breaks lies S. by W. ½ W. from the same islet, distant 2 cables.

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* *See* Admiralty plan, Tutukaka harbour and Nongodo river, No. 1,275; scale, m = 3·0 inches.

The true South head of the harbour lies W.N.W. 6 cables from the above islet, and from it a cluster of rocks extends above water towards the north head for a quarter of a mile, the outer and largest rock being well out of water and one cable in extent. Between this rock and the north head is the passage in; it is one cable wide, and inside opens out to 2 cables.

Anchorage.—The anchorage is 2 cables inside the rock, in 4½ or 5 fathoms; a vessel will then be a quarter of a mile from Phillips island, a high wooded islet which lies in the centre of the harbour, and distant W. by S. ¾ S. half a mile from the entrance rock. From Phillips island the harbour branches off into two arms; they are both shallow, and end in sandy beaches; one runs W.N.W. for half a mile, and the other S. by W. for somewhat less. There is a depth of 15 feet at low water, one cable from Phillips island.

Tides.—It is high water, full and change, in Tutukaka harbour at 7h. 0m.; springs rise 9 feet, and neaps 7 feet.

Directions.—Tutukaka harbour is only fit for small vessels, though H.M.S. *Buffalo* when waiting here for Kauri spars from the Nongodo river, lay for some time moored head and stern, as vessels of large tonnage must do. The rocks at the entrance afford good shelter from easterly winds, and there is a boat channel with 9 feet water between them to the southward. The only directions which seem necessary for entering the harbour are, to avoid the reefs which lie off the South head islet, by giving it a berth of half a mile, and to make for the North head, passing in between it and the entrance rock, both of which are steep-to, with 8 fathoms in mid-channel.

Caution is necessary in entering, as there is generally a heavy swell setting on to the rocks forming the south entrance point to this harbour, and the direction of the tides in their vicinity is uncertain.

NONGODO RIVER lies in the north-west corner of a sandy bay, 1½ miles to the southward of Tutukaka. In this bay there is good anchorage with off-shore winds in 6 and 7 fathoms, sandy bottom; the river can only be entered in fine weather by coasters acquainted with the locality;

it is very narrow, with a rock in the entrance, and carries a depth of 5 feet at low water for a distance of 4 miles within the mouth. Kauri spars have been procured from forests in the neighbourhood of this river, and there are still some to be had.

The bay trends 5 miles in a S.E. ½ S. direction from Nongodo river, and terminates in a projecting point with a small islet lying close off it, which may be passed close in 16 fathoms. W.N.W. nearly a mile from this point is a rock awash, 2 cables off shore.

BREAM HEAD.—From the projecting point, the coast trends S.S.E. 8½ miles to Bream head (*Tewara*) and is almost straight; for a distance of 4 miles the land is moderately high with a cliffy coast, which terminates abruptly in a round hill, and is succeeded by the low land of the Wangari peninsula, the coast being fringed with sand-hills to the neighbourhood of the cape, when the high and rugged land of Bream head immediately over it, and the neighbouring hills fronting its southern face, rise to a height of 1,500 feet.

Bream islet, which is low and about 2 cables in extent, lies N. by W. from the cape nearly one mile; also rocky ledges at distances of one and 2 miles north-westward from it; with from 18 to 20 fathoms one mile from the shore.

Bream rock, on which the sea breaks in heavy weather, lies N.E. by E. three-quarters of a mile from Bream islet; it is about 33 yards in diameter, and has 16 feet water on it. This is a dangerous patch for vessels working to the southward, or rounding Bream head for Wangari harbour.

WANGARI BAY.—Bream head is the north point of Wangari bay: it is 46 miles, S.S.E. ¾ E. from cape Brett, 14½ miles from the north head of Tutukaka harbour, and W. by N. 5 miles from the west or nearest Chicken islet. S. by E. ½ E. 11 miles from it is Bream tail, (*Papaioutou,*) a bluff of moderate height, and the southern limit of the bay, which is 7 miles in depth, running in an uniform curve to the westward, with a sandy beach 10 miles in extent.

At a distance of 2 miles from this beach there is anchorage with westerly winds ranging from north to south, in 8 and 9 fathoms, sand bottom, except within 2 miles of its north-west extreme, or the Sandy (west) point of Wangari harbour, off which extends Mare bank, a sand flat which will be noticed hereafter.

WANGARI HARBOUR.—From Bream head the coast runs in a W. by S. direction towards the harbour, and is steep, with a continuation of the Bream head mountain range rising abruptly from the sea almost to the same height for a distance of 3 miles, when it terminates in Busby head, the east point of the harbour. To the eastward of Busby head a bight runs in for half a mile, which is shoal, and should be avoided. Off the west pitch of Busby head is a steep sugar-loaf cone (called the Frenchman), connected with it by a ledge; this may be considered the entrance point.*

Anchorage.—The coast from this turns directly north; and at a distance of half a mile is Home point, with a hill about 200 feet high over it. Round this point, in Calliope bay, is the first anchorage, and a vessel should only shoot round it sufficiently far for protection from a south-east swell, or about a quarter of a mile and 1½ cables from the shore, as the distance from it to Calliope bank is scarcely 3 cables: this is only a small vessel anchorage.

Calliope bank is an extensive sand-flat extending from Lort point, the northern entrance point of the river, in a sweep, to within 3 cables of Home point, and covering the whole of the bay eastward of it, with the exception of a very narrow channel in shore for coasters; there is scarcely 2 feet on this bank at low water.

Mare bank.—The western portion of Wangari harbour round Sandy or Marsden point, is bordered with sand hillocks from 15 to 20 feet high, the point bearing from the Sugar-loaf N.W. by W. ½ W. 2 miles: and from which Mare bank extends, sweeping round to the east and south-east approaching within 4 cables of Home point, and thence to the southward.

Buoy.—A black buoy in 6 feet at low water, marks Mare bank near Wangari heads.

The channel is thus formed, until abreast of Home point, by the Mare bank on the left and the mainland on the right, and 4 cables is its extreme width. When above Home point, Mare bank still continues the left-hand boundary, and Calliope bank becomes the right, the channel narrowing to little more than 3 cables, until abreast of Passage islet, a small wooded islet, which lies close above Lort point.

Anchorage.—W.N.W. from this islet, nearly half a mile, is the second or Passage islet anchorage.

N. by W. three-quarters of a mile from Home point is a small islet; it lies on the Calliope bank, a quarter of a mile northward of its southern edge. N.N.W. ¾ W. 1½ miles from the same point, and close to the north shore of Calliope bay, is another higher and larger islet, High island, which is used as a leading mark for the channel.

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* *See* Admiralty plan, Wangari harbour, No. 2,047; scale, $m = 3 \cdot 0$ inches.

On the north side of Wangari harbour, in Parua bay, is the cape Breton settlement, and higher up, opposite Limestone island, is Mangapai. The village of Wangari, or Whangarei, is 17 miles inside the heads, and the centre of one of the most fertile districts in the province. There is also abundance of coal, limestone, iron, building stone, &c. in the district.—From New Zealand Almanac, 1874.

As vessels forced into Wangari harbour by stress of weather would seek either of the two anchorages just mentioned for shelter, it seems desirable, before noticing the upper part of the river, to give concise directions for passing through the narrows which lead to them.

Directions.—Vessels entering Wangari under such circumstances should be prepared to shorten sail, and anchor without delay, as the tides are strong, and running in with a fair gale of wind there is not much room for rounding to; a look-out from aloft is also desirable in a large vessel, as the edges of the banks will generally be easily distinguished.

To enter Wangari from the northward or eastward, and after rounding or passing Bream head extreme, keeping half a mile off the shore, when the mountain (Bream head) bears N. by W., steer W. by S., or parallel with the coast, for 2 miles: the Sugar-loaf off the west point of Busby head will then bear N.W. by W. ½ W., and Sandy point will be just open of it; observing that in approaching Wangari on this course, the Sugar-loaf will not appear as detached from Busby head until the above marks are nearly on.

When the above marks are on, steer immediately W. by N. ¾ N. for three-quarters of a mile, which will lead abreast the Sugar-loaf, and 2 cables from it; at this position, alter course to N.N.W. ¼ W., or for the left extreme of High islet on the north shore of Calliope bay (coasting steamers bring the Saddle of Manaia peak a little to the eastward of High islet N.N.W., which is an excellent night mark); little more than half a mile on this course, will be abreast and 2 cables from Home point.

If the first anchorage is desired, haul close round this point, proceeding to the eastward a quarter of a mile, and anchor in 4 fathoms, 1½ cables or less from the shore: here a vessel will be almost out of the tide and in safety.

If the second anchorage is preferred, (and which is recommended for vessels of large size,) when abreast Home point and about 2 cables off it, steer N.W. by N., or one point to the left of High islet on the north side of Calliope bay, for one mile; or until the sand hillock on Sandy point bears W. by S. ½ S., or Passage island open of the land on the north side of the harbour, W. by N. ⅜ N.; then alter course to W. by N. to pass one cable to the southward, or on the port hand of Passage islet in 13 fathoms, and anchor W.N.W. from the centre of the islet, 4 cables distant from it in 5½ fathoms with Darch point bearing N. ¾ E. A vessel will then be a quarter of a mile from the shore, and about the same distance from the outer point of Snake bank, which is marked by a red buoy in 12 feet at low water.

Soundings.—By following the above directions a patch of 4½ fathoms (on which there is a breaking sea with strong winds and particularly on the ebb tide) will be passed over, extending E.S.E., one mile from Busby head; thence mid-channel to abreast the Sugar-loaf, from 6 to 9 fathoms will be carried. From the Sugar-loaf to abreast Sandy point, 10, 12, and in some places 14 fathoms. Thence to Passage islet from 8 to 9, and close to the islet 13, when it immediately shoals towards the anchorage to 7 and 5 fathoms over sand and mud.

Tides.—It is high water, full and change, in Wangari harbour at the lower anchorages at 7h. 0m.; springs rise 9 feet, and neaps 7 feet. The tides run 3 knots.

Caution.—The banks of the channel are rather steep; and if a vessel gets into 4 fathoms on either side, she is too close. Vessels bound to Wangari from the southward should not steer inside a line from Bream tail to the Sugar-loaf, or if the latter cannot be seen, the high hill eastward between it and Bream head, until within the proper distance of that land, for entering the channel.

Directions.—In working up Wangari bay to the northward for the harbour, an isolated round hill will be immediately seen, rising out of the low land on the south side of Wangari; this hill is one mile from the beach, and bears from Sandy point, S.W. by S. 3½ miles. To avoid Mare bank; as soon as this hill is brought to bear W. by S., vessels must not stand in so far as to bring the Sugar-loaf to the northward of N.N.W.

Wangari river.—The passage between Lort point and Sandy point is half a mile wide, and may be considered the entrance of Wangari river: above these points it opens out to a width of 2 miles; the south shore is low and swampy, while the north is overlooked by hills of considerable height.

There is a channel of 3½ fathoms at low water, as far up as Limestone island, a distance of 8 miles; and it preserves an average width of nearly a quarter of a mile: with the exception of this channel the water is shoal, with numerous flats dry, or nearly so, at low water. To make the river generally available for vessels of large tonnage, it would require to be buoyed; but with care and attention to the chart, anchorage as high up as Single tree point may be obtained without any other aid.

Single Tree point, about 20 feet high, is a flat clay cliffy-looking point, with a solitary tree on its extreme, which will be seen a long distance, there being no others in the vicinity; it bears from Sandy point W. by N. ¼ N. 2¾ miles. To the south-eastward of Single tree is another point of the same nature, but lower (Sinclair point), it is the commencement of the line of clay cliffs, and bears W. ¼ N. from Sandy point

$1\frac{6}{10}$ miles; the channel, as far as Single tree point, lies on the south shore at a distance of about half a mile from it, and between it and Snake bank.

Snake bank extends from a little above Passage islet anchorage, in a north-west direction, nearly 3 miles; this bank is covered at high water, except a serpentine spit, always dry, and bearing from Passage islet W.N.W. 1¼ miles. Vessels bound up the river without anchoring should pass exactly mid-way between Passage islet and Sandy point, where the water is very deep (one cast of 20 fathoms).

Buoy.—The outer point of Snake bank is marked by a red buoy in 12 feet at low water.

When the centre of the islet bears N. by W. ½ W., steer directly for the tree on Single tree point W. ¾ N. for 1¼ miles, carrying 4 fathoms; Sinclair point will then bear S.W. by S., when steer N.W. by W. ¼ W., or a little to the left of the high land over Annoyance point (exactly for the left extreme of the point), for one mile, in from 5 to 7 fathoms, when the Single tree will bear S.W. nearly half a mile, and a vessel may anchor in 5 fathoms mid-channel; above this the southern coast recedes, and becomes very low and swampy, with mangrove bushes.

From Single tree point the channel contracts for some distance to less than 2 cables, and no natural marks sufficiently accurate to lead a vessel through can be given. The line of shoal water may often be distinguished by the discolouration and by the tide line; these indications and the lead will be the best guide until the river is buoyed. The general course, from the position given off Single tree point, is W. by N. for 2¾ miles, leading rather towards the northern shore in from 3 to 3½ fathoms; when this distance is run, or the high land over the right extreme of Annoyance point bears N.E. by E. ¾ E., steer N.W. by W. ½ W. for about 2 miles, or until a remarkable shoulder sloping to the north-west (the termination of the high land on the north shore) bears E.N.E. With this remarkable shoulder directly astern, a course may be steered mid-channel between River point and the north point of Limestone island. Coasters go some miles above this at high water, and the country is one of the finest in New Zealand; there are several farms on the river banks.

There is a large but shallow bay on the north side of the channel, Maori bay; its entrance is N. by W. 1½ miles from Single tree point; this bay is only fit for coasters, as the middle ground must be crossed from Single tree in 9 feet, and at low water the anchorage within does not exceed that depth; on its shores the natives have some small cultivations.

Directions.—"After leaving Passage island bring it on with the Saddle on Bream head, steering for the outer extreme of Annoyance point, which leads past the Snake bank and Single tree point in mid-channel, between the red buoy on the south-east end, or tail, of Snake bank, and the black buoy on the western edge of the channel about half a mile to the eastward of Single tree point; and when the peak to the northward, a little way within Martin point, opens clear of Becher point, steer more to the westward for Limestone island, which is 8 miles above Passage island, for 2 miles or until Single tree point touches Sugar-loaf point, passing the next red buoy on the starboard hand, when steer for a flat table hill in the interior, which will be in line with a house on the beach north-east of River point opposite Limestone island, leaving the red buoys on the starboard, and the black buoys on the port hand (four of each) till past the last pair of buoys, where the channel is narrow, which lie about three-quarters of a mile eastward of River point; hence the course is straight to pass the point about half a cable off; from the inner anchorage to River point, the soundings vary from 7 to 3 and 3½ fathoms.

"Above River point is a long reach to the N.N.W. of about 4 miles between mangroves, about 1½ miles apart, the channel being midway between them about 1½ cables wide, to some high land on the north side, whence the channel winds for about 2½ miles to the wharf at Wangari, where there is a depth of 8 to 11 feet at high water, the rise of tide being 7 to 10 feet.

"Limeburners' creek—to which the railroad is in course of extension from Wangari—is about 1½ miles below it, and some 5 miles above Limestone island. The river shoals immediately above River point from 4 fathoms to 7 and 5 feet at low water in Long reach, 6 feet in Short reach, and at a quarter of a mile above Limeburners' creek is nearly dry at low water. The channel can be distinguished by the colour of the water on the edge of the banks up to half-flood, after which proceed by the lead. The colliers can back and fill or tow up. Small ones locally acquainted can beat. The leading marks, given above, to River point are being continually used at night.

"Mangapai river branches off to the S.W. abreast of River point, south-eastward of Limestone island; steamers proceed 7 miles up it."*

Note.—From the foregoing it would appear that the banks in Wangari river have changed considerably since 1849.

Water.—Fresh water may be obtained at either of the lower anchorages; at the first, in Calliope bay, there is a small river half a mile above the anchorage, where it can be got with much facility: at the Passage islet anchorage, there is a stream running through a stony beach abreast the anchorage.

Coal.—The coal mines, Kamo and Whau-whau at Wangari, are about 75 miles by water from Auckland. "The former has been in operation some time, and a railway is now near completion from the mine to the loading ground; at the terminus there will be a depth of 22 feet at low-water springs. The navigation to the loading ground is free from any obstructions, and the harbour quite land-locked. On completion of the railway, about October 1880, the proprietor will undertake to deliver 500 tons of coal per day, at 10*s*. per ton."

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* Brett's New Zealand pilot, November 1880.

"The output of Whau-whau coal mine is about 2,000 tons of coal per annum. Mine not fully at work, capable of producing 100 tons per day easily. The quality of the coal is reported to be next for steam-producing purposes to the Bay of Islands coal. Can be delivered on the completion of the railway, about October 1880, at loading place, with 22 feet of water at low springs, at 10*s*. per ton. Can deliver 500 tons per day if required."*

Ruakaka is a small rapid river, with a quicksand bar entrance of 7 or 8 feet at high-water springs, which empties itself into Wangari bay about 4½ miles from Sandy or Marsden point. It is navigable for small vessels of about 15 tons for about 3 miles up, and leads to a large Kauri gum district.

Waipu river lies about 7 miles south-eastward of Ruakaka. It has a shifting bar entrance, with about 6 and 7 feet water on it at high-water ordinary springs. It is navigable for small vessels 5 miles up.

Mackenzie cove lies about midway between Waipu river and Bream tail, with anchorage sheltered from East, round south, to N.W., for small vessels which discharge passengers and cargo here when the river is not practicable; a boat can always land under the reef, while vessels stand off and on.

McGregor rock, a sunken danger, lies nearly midway between Toutorou or Sail rock and Bream tail: it has 11 feet water on it, and from it Bream island bears N.N.W. ½ W. (northerly), and Toutorou rock N.E. ½ E. 2¾ miles.

BREAM TAIL to RODNEY POINT.—From Bream tail the coast trends S.E. ¾ E. to Rodney point, 17½ miles:—it is almost straight with long sandy beaches; the land is not high, but slopes gradually from a continuation of the Bream tail range to the beach. In the neighbourhood of Rodney point the coast is more hilly. Mount Hamilton, a remarkable wooded eminence with a double summit, rises to a height of 1,300 feet, 6 miles to the westward of it.

Soundings.—The soundings off this part of the coast are regular, 30 fathoms 5 miles off the land, and shoaling gradually to 6 fathoms within half a mile. Rodney point is a bold cliffy point, not high itself, though high land rises at the back; it may be passed close.

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* Nautical Magazine, November 1880.

Mangawai river lies 2½ miles south of Bream tail. A rubble breakwater extends from its northern entrance head to the rocky islet off its mouth, which protects the entrance from north-easterly and northerly winds. The construction of this breakwater has had the effect of deepening the channel about 4 feet, where there is now a depth from 11 to 13 feet at high water, making the river much easier of access, and available for vessels of a larger class than formerly. The principal landing place is 4 miles above the entrance. This is the nearest harbour on the east coast to the heads of the Otamotea and Oruawharu, branches of the Kaipara river. When the river is not safe to enter with strong easterly or south-easterly winds, landing can generally be effected in Mackenzie cove.

TAKATAU POINT.—The next projecting point south of Rodney point is Takatau; it bears from the former S.E. ¾ S. 5¾ miles, and is a long remarkable looking point, with several conical rocks off its extreme, outside which is a shelving ledge under water, extending fully 2 cables off, which causes a strong tide-rip; a wide berth should be given this point in passing, keeping Tiri-tiri light open.

OMA BAY.—Between Rodney and Takatau points is Oma bay, in the bight of which midway between the points is Little Oma bay, horse-shoe shaped, and 3½ miles in depth; there is anchorage in it with off-shore winds in 5 to 9 fathoms, but it is exposed to easterly winds, when a heavy swell rolls in. In its north-west corner is a creek frequented by small coasters.

Oma cove.—One mile south of Rodney point is Oma cove, a double-headed creek, where coasters frequently find a stopping place in north-west winds; there is a reef above water off its north point; the anchorage is in 5 fathoms, one-quarter of a mile from the beach.

KAWAU ISLAND.—Southward of Takatau point about 2 miles, is Kawau island, 4 miles long in a north-west and south-east direction, and 3½ miles broad. It is hilly and well wooded, its average height being 500 feet; on the west side is Bon Accord harbour, with good anchorage for the largest vessels; immediately north of this harbour is North cove, an anchorage for small vessels.*

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* *See* Admiralty plan, Kawau island, No. 1,998; scale, *m*=2·7 inches.

The island is now entirely owned by Sir George Grey, K.C.B., who has built a handsome mansion on the shores of Fontelaye bay, and is rapidly cultivating and improving his property. The island has been stocked with wild cattle, sheep, elk, deer, kangaroo, and various sorts of birds; every rare plant that will live at Madeira flourishes at Kawau, the climate of which island being similar to that of St. Michael's, in the Azores.—From Remarks of Captain George Palmer, H.M.S. *Rosario*, 1868.

To the westward of Kawau island is an extensive inlet, Kawau bay: it extends westward for 4 miles, and is about the same extent in a north and south direction, with a depth of from 4 to 6 fathoms in almost every part; in its north-west corner is the river Matakana, navigable for coasters.

Channels.—There are three principal channels to Bon Accord harbour and Kawau bay, viz.:—the north, south, and inner channels. The north channel lies between Takatau point and the north shore of Kawau island, the south channel between the south side of that island and the Kaitu-kala islands; the inner channel, which is convenient for vessels from Auckland or from the southward, and the easiest for navigation, is inside Motu-ora and Kaitu-kala islands, or between them and the mainland.

North channel, which is recommended for a vessel from the northward with a leading wind, or indeed with any wind but a strong westerly one, has the following dangers:—

Maori rock, awash at low water and a cable in extent, lies S. by W. nine-tenths of a mile from Takatau point.

A beacon, composed of an iron rod with an open ironwork barrel-shaped top, 10 feet above high water, marks the rock.

Fairchild reef, a large flat rock awash at high water, lies from Takatau point South 1½ miles, and from Kawati point, the north point of Kawau island, E. ½ N. eight-tenths of a mile; this rock is N.E. ½ N. a quarter of a mile from Slip islet on the Kawau shore, and can scarcely be called a danger, being always visible and out of the usual track of vessels.

Patches.—Two rocky patches of 13 and 15 feet lie off Maori point, at respective distances of 3 and 4½ cables, which bear from Maori rock S.W. by W. ½ W. 3¾ cables and S.W. 3 cables. Between these patches and Maori point, off which sunken rocks extend some distance, is a narrow channel one cable broad.

Sunk-kelp, a shoal of 8 feet at low water, lies West 3 cables from Kawati point.

Iris shoal.—The shoalest part is 20 feet, from which Kawati point bears N.E. ¾ E. 1¼ miles, and the north extreme of Pembles islet S.E. by E. ¾ E. half a mile, with a deep water channel between.

North Channel directions.—In navigating the north channel it must be remembered that a tide of 3½ knots runs at springs. The passage between Maori rock and Fairchild reef on the Kawau shore is the best, there being a clear distance of more than half a mile between.

The passage north, or inshore of Maori rock, being only one cable wide, should not be used unless under favourable circumstances, or by those acquainted with the channel, and when the rock is visible. Maori rock must in this case be passed within 1½ cables, and the 13-feet patch off Maori point within one cable.

Vessels from the northward or eastward with a leading wind, and taking the wider and better channel, should pass Takatau point at a distance of about half a mile; when abreast this point and bearing West, if Maori rock is covered, steer S. by W. 1¼ miles, or until Kawati point bears S.W. by W. ¾ W., then Maori rock will bear N.W. by W. ¼ W., half a mile distant. Thence steer W. by S. 1¾ miles, or until Pembles islet, which lies close off the north point of North cove, is in line with the westernmost point of Kawau island, which is half a mile to the southward of Pembles islet. Kawati point will then bear E. by S. ¾ S. rather more than half a mile distant, and a vessel will be well clear of Sunk-kelp, the shoal off it; a course may now be steered S. ¾ W., which will clear the Iris shoal patch of 20 feet, 3 cables on the starboard hand, and pass outside Pembles islet distant 2 cables. When the entrance to Bon Accord harbour, which is one mile southward of Pembles islet, opens out, haul in and anchor in mid-channel, abreast the second bay on the south side, in 4½ fathoms.

In entering the north channel when Maori rock is seen in passing Takatau point, a course may be steered to pass outside it about 3 cables; and when the rock bears N.W. by N. at that distance, steer W. by S. as before directed, and observe the same marks for clearing Sunk-kelp off Kawati point and entering Bon Accord harbour.

A good mark for Maori rock is the northernmost Mayne island in line with Kawati point, which leads directly on it; consequently vessels passing in or out of this channel, may be certain that when Mayne island is not open of Kawati point, they are to the southward of the rock.

BON ACCORD HARBOUR lies about the centre of the west side of Kawau island; it runs in an east and west direction for 1½ miles, and is 6½ cables wide at its entrance; half a mile within (which is as far as a large vessel should enter) it is 4 cables wide. There are several bays on its south shore; in Momona, the outer bay, small vessels anchor but do not remain with a fresh wind from northward or westward; the best anchorage is in mid-channel abreast the second bay, with Accord point, the north entrance point, W. by N. ½ N. half a mile distant, and Momona point in line with the western point of the second bay.

Water.—In a bay on the north side of the harbour, abreast this anchorage, fresh water may be obtained with much facility.

Smelting cove, on the north shore of Bon Accord harbour, one mile from the entrance, affords good anchorage in 3 fathoms off its west sandy point; there was a large smelting establishment in this cove, built with stone obtained from the Matakana river quarries.

Martello rock.—S.W. ½ W. from Momona point—the southern head of Bon Accord harbour—nearly half a mile distant, is the Martello rock, so called from its resemblance to a Martello tower, surrounded by a reef, extending north and south 1½ cables, with a good passage between it and Kawau island of more than a quarter of a mile.

Mayne islands.—Directly off the mouth of Bon Accord harbour westward, at a distance of 1¼ miles, are the Mayne islands, two small islands lying in a N.N.W. and S.S.E. direction, half a mile apart, with a reef lying between.

Eclipse shoal lies between the northern Mayne island and the north entrance point of Bon Accord harbour. The shoal is nearly circular, about three-quarters of a cable in extent with 1¾ fathoms water on it. The middle of north Mayne island bears W. by S. ¼ S. distant 3¾ cables from it; and Fish point, the south point of Kawau bay, is just shut in with south Mayne island.

North cove is half a mile to the northward of Bon Accord harbour; it is a quarter of a mile wide at its entrance, and anchorage may be had in 3½ fathoms, at that distance inside the heads: a reef of rocks awash, lies 1¼ cables north of Edwards point, its southern entrance point. Much sea sets into this cove with westerly winds.

Dispute cove is a small cove on the south side of Kawau island, one mile south-east of Bon Accord harbour, it is without shelter with westerly or north-westerly winds. The copper mines formerly in this cove have ceased to be worked.

The southern side of Kawau island may be passed within less than half a mile in 14 fathoms; near the south-east extreme is Bostaquet bay, where a vessel may anchor with northerly winds: two small steep islets lie one cable off-shore to the southward of the south-east point of the island (Kawau point), with a boat passage inside them.

The eastern side of Kawau island is a steep and bold cliffy shore, and may be approached within a quarter of a mile, in from 12 to 15 fathoms, the only danger is Nelson rock.

Nelson rock with 6 feet water at low springs, and 5 to 10 fathoms close-to, lies between Flat rock and Kawau island, 3½ cables from the shore, with the south-east point of Kawau, S. by W. ½ W.; Flat rock, E. ¼ S.; Tiri-tiri lighthouse, S. by E. ¼ E.; and Takatau point, N.W. by N.

Flat rock.—E. by N. ½ N. from Kawau point, 2 miles distant, lies Flat rock, which has been already described (p. 20).

Tides.—It is high water, full and change, in Bon Accord harbour at 6h. 30m.; springs rise 10 feet, and neaps 7 feet. The flood tide runs to the westward through the north channel, sweeping round Kawau bay to the southward; on the east side of Kawau island the flood runs southward and with considerable strength near the south-east extreme. The ebb runs to the northward on both sides of the island, and to the eastward through the north channel, at the rate of 3½ knots during springs. In the southern and inshore channels their velocity is from 1½ to 2½ knots.

South channel.—The Kaitu-kala islands, between which and Kawau island is the south channel, are two small islands, each little more than half a mile in extent; they are bare of trees, moderately high, and have a passage, Blanche channel, 1¾ cables wide between them, with 6 and 7 fathoms water. Their northern end bears from the south-east point of Kawau S.W. ¾ W. 3¾ miles, and from Wanga point, the northern point of Wangaproa peninsula, N. by W. ¾ W. 7⅓ miles. The impediments to navigation in the south channel are, the Beehive islet and reef, Passage reef, and Albert shoal.

The Beehive.—The Beehive is a remarkable cone-shaped islet, with a white sandy beach round its base, surrounded by a reef, 2½ cables from east to west, and one cable from north to south, bearing N. ¼ E. one mile from Kaitu-kala islands, and S.W. ¾ W. six-tenths of a mile from the south point of Kawau; it may be passed on either side. The clear passage, Rosario channel, between it and Kawau island, is 3 cables wide, with not less than 3½ fathoms at low-water.

Rosario Channel directions.—If this passage is taken, steer in mid-channel between Beehive islet and the point of Kawau island, as a reef extends one cable south of the latter. Immediately on passing the Beehive, the water deepens to 6 fathoms, and a direct course may be shaped for Martello rock, N.W. by W. ½ W. distant 1½ miles; when within a convenient distance of the latter, pass either side of it, and enter Bon Accord harbour as before directed.

The projecting point, 2 cables south of Momona point, has two peaked rocks lying close off it, which is a good mark from the southward.

Passage reef.—The channel between Beehive islet and Kaitu-kala islands is divided by Passage reef, a cluster of rocks half a cable in extent and dry at low water, which lie nearly in the centre of it. The channel southward of this reef is the widest and deepest; that to the northward should not be taken unless the rocks are seen awash; the course will then be in mid-channel, between them and the Beehive in 4 fathoms, and when they are past, West, until the marks are on for clearing Albert shoal. Passage reef bears from the north end of Kaitu-kala island, N. by E. ½ E. three-quarters of a mile; and from Beehive, S.S.E. ½ E. 3½ cables.

A small 3-fathom patch lies W. ¾ S. distant six-tenths of a mile from Passage reef.

South Channel directions.—The passage between Kaitu-kala islands and Passage reef is more than half a mile wide, with 6 and 9 fathoms, and is preferable for large ships to those just described. Vessels from the eastward or northward, intending to take it, after passing the south-east end of Kawau island, should steer for the northern end of Kaitu-kala islands until within half a mile of it, or until the summit of Fish point (the southern point of Kawau bay) bears W. by N. ½ N., when a course should be steered for that point to pass to the southward of Albert shoal, passing about 3 cables from the north end of Kaitu-kala, or nearer if convenient. When the Martello rock bears N. by E. ¼ E. a vessel is to the westward of Albert shoal, and may steer direct for that rock ; on this course, and when the Beehive bears E. by S., are 9 fathoms water, and the shoal will lie on the same bearing, about 3 cables distant. When the Beehive bears E.S.E., a vessel will be well clear to the northward of it, and may pass either side of the Martello rock into Bon Accord harbour. An excellent mark for clearing the Albert shoal, and one which cannot fail to be recognized, is the Martello rock in line with a remarkable drop in the coast to the northward (the neck of Takatau peninsula), bearing a little to the eastward of North, which leads westward of the shoal nearly a quarter of a mile. A vessel intending to pass westward of it, must on no account haul up for Bon Accord harbour, until the Martello rock is brought on or to the eastward of this mark.

Albert shoal is 2 cables in extent, and its shoalest part has 10 feet at low water; it lies in a direct line between Beehive islet and the north extreme of Fish point, and bears from Beehive islet, W. ¾ N. nine-tenths of a mile; from Martello rock, S. ¾ E. the same distance; and from south point Bon Accord harbour (two peaked rocks), S. by W. ¼ W. one mile.

If it is intended to pass eastward of the Albert shoal, between it and Beehive islet, the channel is more than half a mile broad, and the least water 3½ fathoms. After passing Passage reef, and bringing the north end of Kaitu-kala to bear S. by E. ½ E., steer for Momona point or on a course between it and the Martello rock, for the harbour ; this will lead a clear quarter of a mile eastward of the shoal.

Motu-ora lies S. by W., one mile from the south Kaitu-kala: its south-west point bears from Wanga point N.W. 5¾ miles, and from the entrance of Maurhangi harbour E. by N. ½ N. 2¼ miles; it is 1½ miles long, about 300 feet high, and lies in a north-east and south-west direction, with some rocky patches extending off its north-east and east side nearly a cable.

Inner channel.—Between Motu-ora and the Kaitu-kala islands and the mainland, is the inshore channel to Bon Accord harbour and Kawau bay; and for vessels from the southward through the Wangaproa channel, it is the easiest and most convenient, particularly with a working wind, as from the south point of Motu-ora to Fish point there is a clear working channel 1½ miles wide, with from 7 to 9 fathoms.

In working from the southward, vessels may pass between Motu-ora and the south Kaitu-kala, if convenient, there being deep water, and a channel of nearly a mile in width; but the Blanche channel between the Kaitu-kala islands should not be taken, unless with the wind directly through.

KAWAU BAY.—With the exception of the reefs between the Mayne islands, there are no dangers in this bay; outside a line from Fish point to Matakana river, there is a general depth of from 4 to 7 fathoms over sandy bottom: inside this line the water shoals to 3 and 2 fathoms, except in the bay immediately westward of Fish point, where there is snug anchorage in 4 and 5 fathoms, with southerly winds. Coasters alone may pass between the Mayne islands; there is a reef in the centre of the passage, and another, nearly joining it, extending from the north end of the south island, leaving a passage between half a cable broad, with 2 fathoms. There is a wider passage between the middle reef and the north island; these reefs and the deepest channels will be seen at low water.

MAURHANGI HARBOUR and RIVER.—The next harbour southward of Bon Accord, and nearly 7 miles distant from it, is Maurhangi, on the mainland. The entrance may be known by the small saddle-shaped island, Whora, which lies a little more than half a mile distant from it; this, and Motu-ora, afford good protection to the harbour from easterly winds.*

Whora island lies N.W. by W. ¼ W. 7 miles from Wanga point, the extreme of Wangaproa peninsula, and W. by S. nearly 2 miles from the south end of Motu-ora. Vessels bound to Maurhangi should steer to the southward of both these islands, and passing the south end of Whora, within a quarter of a mile, a course should be steered direct in between the heads.

The south head is wooded, and has a small conical islet (*Kiahou*) connected by a reef, lying 2 cables north of it; shoal water extends half a cable off this islet.

The north head, Sadler point, a steep green point without trees, should not be approached nearer than one cable, as a shallow sandy spit extends from it; the clear channel between the heads is little more than half a mile in width, with from 5 to 8 fathoms water.

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* *See* Admiralty plan, Maurhangi harbour, No 1,094; scale, *m* = 1·5 inches.

Caution.—Strangers entering Maurhangi harbour, are liable to mistake the arm which runs immediately north from Sadler point, for the main harbour: there is, however, shoal water in this arm a short distance within the line of the points.

Directions.—The direct course up is N.W. ½ W. for the peninsula of Manga-nui, which is high, and makes as an island; its centre bears N.W. ½ W. from the north head, distant 1½ miles; between this peninsula and the south shore is the best anchorage for large vessels, with the centre of Manga-nui N. by E., in 7 fathoms muddy bottom; the channel here is scarcely half a mile wide. Westward of Manga-nui is another arm, running to the N.N.W., with shoal water a short distance within its entrance points.

Anchorage.—There is more sheltered anchorage in 5 fathoms three-quarters of a mile above Manga-nui; immediately above this anchorage it shoals, with flats which dry at low water; boats can ascend the river several miles with the tide.

Kauri forests existed near the head of the river; H.M.S. *Buffalo* procured many spars from them.

There is a narrow passage into Maurhangi harbour from the northward between Whora island and the mainland; a reef of rocks extends off the northern end of the island in a northerly direction for nearly a quarter of a mile, leaving the passage one-quarter of a mile wide, with 5 and 6 fathoms water; the reef is dry at low water, with 3½ fathoms close to its edge. The winds in this passage are generally baffling, and unless when blowing directly through, it is not desirable for anything but coasters.

Rock.—Southward of the harbour there is a detached rock, uncovered 6 feet at low water, distant 4 cables from the nearest shore; from it Kiahou islet point bears N. ¼ W. 1¼ miles distant; and Whora island south extreme, N.N.E. ½ E. 1¼ miles. Abreast this rock lies Puhoi river, where there is a German settlement.

Tides.—It is high water, full and change, at Maurhangi at 7h. 0m.; and the tides rise from 7 to 10 feet.

The coast southward of Maurhangi harbour trends S. ½ W. 5 miles into the bight which lies westward of Wangaproa peninsula; this coast has several rocky ledges and detached reefs lying off it, and should not be approached within half a mile, at which distance 6 fathoms will be found; these dangers can be seen in the daytime.

Waiwera—noted for its hot springs—lies about 3 miles southward of Maurhangi, and may easily be known by a small islet about half a mile from the beach of a small bay, and a quarter of a mile off its north point; a spit, which nearly dries at low water, extends to it from the beach, with rocks inside. There is anchorage with off-shore winds abreast the islet, which must not be opened of the land northward of it, in 4 or 5 fathoms. Sunken rocks extend nearly a cable off the south-east point of the islet, which break heavily in easterly weather. The holding ground is good, but the anchorage is exposed to winds from N.N.E., through east, to South. The best landing is across the spit into the river; boats can cross at two hours after low water.

Caution.—Vessels may anchor in this bight (Wangaproa bay), in from 8 to 14 fathoms, with westerly or southerly winds, but its head should not be approached within one mile, as the water shoals to 4 fathoms, and flats extend a long distance off; with strong north-east winds, vessels should not get embayed here, as a heavy sea sets in.

WANGAPROA PENINSULA extends from the mainland in a N.E. by E. direction for 5 miles, and is nearly separated in two places by deep bays running in on both sides. Its eastern face and Tiri-tiri island form the Wangaproa channel; this channel has already been described (see p. 21).

Dangers.—Wanga point, the north-east extreme of this peninsula, has shelving tidal rocks extending off it to the north-east, one-third of a mile, which are steep-to; and also along shore to the westward for about 1½ miles. A sunken rock with 9 feet, and 6 fathoms close to it, lies from the shore westward of Wanga point, nine-tenths of a mile; it lies off the northern edge of an outlying reef, dry at low-water springs, between which and the shore is a narrow channel with 3½ fathoms. From this sunken rock, Wanga point bears E.S.E., one mile; and the high rock off the north end of Tiri-tiri island, E. by N., 3½ miles.

Anchorage.—On the southern side of Wangaproa peninsula is good anchorage, in 6 fathoms, with northerly winds, off a double sandy bay—from whose middle point a rocky ledge extends about 1¾ cables—about a mile from the south-east extreme; and 1½ miles farther west is another bay, off whose western extreme is a small islet (Frenchman's cap), lying a quarter of a mile from the shore.

TOFINO BAY is the western bight; here there is anchorage in 5 to 6 fathoms, with northerly and westerly winds. At the head of the bay are two small rivers; Weiti, the northern, has 3 feet water on its bar at low water, and 2 fathoms inside; it is navigable for some miles for small coasters. The southern river, Okura, is dry at the entrance at low water, with deep water above. Two and a half miles southward of Okura river is Gull point, a projecting headland, with a rocky patch, which dries at low springs, lying one cable off it. About half a mile to the southward of the point is a ledge of rocks, three-quarters of a mile off shore, which dries at half-tide, extending about 2 cables south-eastward, parallel with the shore.

Caution.—Vessels working along the shore should be careful to avoid this ledge, observing that the S.E. ¾ S. dividing line of white and *red* sections of Bean rocks light cuts close to it.

From this reef to the North head of Auckland harbour there are no dangers, and the coast may be safely approached within half a mile.

FRITH OF THAMES.

CAPE COLVILLE, the eastern limit of the Hauraki gulf, is the northern extremity of a peninsula more than 40 miles in length, the western shores of which are bold and cliffy, and form the eastern boundary of the Frith of Thames. Throughout the whole length of this peninsula, runs a chain of high and wooded mountains rising abruptly from the sea on either shore, two of the peaks over the cape reaching a height of nearly 3,000 feet.

Soundings.—The entrance of the Frith of Thames is 17½ miles in breadth from cape Colville to Thumb point, the north point of Waiheki island, with uniform soundings of 22 to 26 fathoms mud, gradually decreasing to the bar of the river Thames.

COROMANDEL HARBOUR (*Waihou*) entrance is 20 miles S.S.E. of cape Colville, and 12 miles E. ¾ N. from the eastern entrance of Waiheki channel. Its position is well marked from a distance by Castle hill, which has a square rocky crest, 1,600 feet high, lying 3 miles eastward of the head of the harbour. The entrance will also be easily known, by the small round islet Tuhuia lying 1¼ miles immediately west of it; a smaller rock lies one-third of a mile S.S.E. of Tuhuia: there are likewise three islands north-west of the north head, each from half a mile to 1½ miles in extent, the extreme island being more than 3 miles distant. In entering, a vessel may pass on either side of Tuhuia, in deep water.*

Coromandel harbour is formed on the north side by Waihou peninsula, which is joined to the main by a narrow sandy neck ; and on the south side by the mainland : the harbour runs north-east and south-west, is one mile wide at the entrance, and carries a depth exceeding 5 fathoms for 1½ miles inside.

Anchorage.—The best anchorage is immediately round the south-east point of Waihou peninsula, about 3 cables off shore in 4 fathoms: a quarter of a mile above this anchorage the water shoals to 14 feet, and the large expanse of water at the head of the harbour, has a depth of a little more than one fathom. There is also a shoal patch of 4 feet, 3 cables above the anchorage, which bears from the south-east point of Waihou peninsula N.E. three-quarters of a mile, and from the sandy neck S.E. ½ E. 9 cables. Vessels in taking up an anchorage, should not open out this sandy neck; they are then certain to be clear of the shoal patch, and in not less than 3 fathoms.*

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* *See* Admiralty plan, Coromandel harbour, No. 2,035 ; scale, $m = 2 \cdot 0$ inches.

There is a wharf at Keven's point, at the north-east head of the bay, with 9 to 10 feet alongside it at high water ordinary springs.

COAST between Cape Colville and Coromandel harbour. — The three islands which lie immediately north-west of Coromandel harbour are Huieh, Waimata, and Hoki, extending about 3½ miles in a N.W. by N. and S.E. by S. direction.

Huieh, the northernmost, lies 1½ miles S.S.W. of Areeka point, it is high and cliffy on its northern and western sides, terminating in a low shingle point to the eastward, and is three-quarters of a mile in extent; a small islet lies a quarter of a mile north-eastward of this low point, and another 4 cables south-west of its south-western point; there is also a rock above water a quarter of a mile off its south side.

Waimata, the middle island, 1⅓ miles in length north and south, is a double island connected at low water by a sandy neck; the northern portion is called Kopuki. W.N.W. 3 cables from the north-west cliffy head of Waimata, is a reef of rocks covered at high water; and half a cable off its southern end is a sunken rock. The passage between Waimata and Huieh, has a clear 3 cables width with a depth of 10 and 11 fathoms.

Hoki, the southernmost and smallest island, is half a mile long, having a passage of nearly the same width between it and Waimata, with 13 fathoms water. There is a passage for vessels between Hoki and the shore with 6 fathoms.

Areeka point, which has a ledge of rocks extending a short distance off it, lies S. by E. ½ E. 5 miles from Cabbage bay. It forms the north point of a deep bight, at the head of which is Kikowhakariri bay, frequented by coasters for the logs which are floated down its creek. The southern side of this bight is formed by the Waihou peninsula.

Two miles north-west of Huieh island, is another chain of islands, extending along the coast in the same direction for 4 miles. Half a mile south of the southernmost island is a rock awash; the passage between it and Huieh is 1½ miles wide, with 10 and 14 fathoms.

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* Mr. E. W. Creak, master of H.M.S. *Esk*, in 1864, remarks :—"that, since the original survey, the harbour appears to have been filling up; as, on examination, he found 4 or 5 feet less water than the depths expressed on the chart."

The northernmost of this chain of islands, is a small islet lying S.W. by W. ½ W. 3½ miles from the south point of Cabbage bay, which is a small bay, open to the westward, midway between cape Colville and Coromandel harbour, having 3 fathoms water in it, and visited by coasters for timber; there are sawmills here. There are many rocks awash lying amongst these islands, and strangers should not pass between them, except in the wide channel, where the dangers have been more particularly described. There is, however, a channel between them and the mainland, a mile wide in its narrowest part, through which a vessel can run in perfect safety for Coromandel harbour, carrying from 7 to 10 fathoms water.

From Cabbage bay the coast, which is bold and cliffy, trends northwestward for 10 miles to cape Colville.

TEKOMI HARBOUR.—Two small harbours lie immediately south of Coromandel harbour: the first, Tekomi, 3½ cables wide at its entrance, is well sheltered by the island of Rangipuka (more than three-quarters of a mile long, in a north-west and south-east direction), lying close off its entrance. Half a mile inside the heads of this harbour, a vessel may anchor in 4 fathoms:—there are 3 fathoms three-quarters of a mile inside, but above that, shoal water. Rangipuka may be passed on either side: the north side is the best, as a reef extends southward from the south end of the island 1¼ cables.*

MENIA BAY, a mile south of Tekomi, is not so good an anchorage; the two islands, Wekarua, extend 6 cables south-westward from its northern head, and there is anchorage in 3½ fathoms, three-quarters of a mile inside their outer extreme: this bay is open to westerly winds.

Deadman point is the southern entrance point of Menia bay, off which several rocks above water extend a quarter of a mile.

DANGERS.—One mile southward is the small open bay of Kirita. About 2¼ miles W.S.W. of the southern point of this bay, a rock is known to exist by the Maoris (who use it as a fishing ground) with 2½ fathoms on it at low water. From it a burnt patch is in line with the conical hill Wakatarata on about the same bearing.

Middle bank with 3 fathoms at low water, lies about 2½ miles S.W. by S. from this sunken rock, in the middle of the Frith, with Deadman point N.E. by N. 5 miles, and the north-eastern extreme of Ponui island N.W. by W. ¾ W. 7¼ miles.

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* *See* Admiralty plan, Coromandel harbour, No. 2,035; scale, $m = 2 \cdot 0$ inches.

Commander Drury, in describing this harbour in the New Zealand Government Gazette of July 5, 1855, remarks "that the anchorage, 2½ fathoms, is within the island of Rangipuka, one-third of a mile from the entrance."

The coast from Deadman point trends south-eastward for 16 miles to Tararu point. Waikowhau and Tapu creeks lie nearly midway between, and are visited by small coasters. At the latter gold mining is carried on. The shore may be approached to half a mile as far as Tapu creek, whence the shoal water gradually extends off shore, curving round to the western shore of the Frith; the 3-fathom line being 6 and 7 miles off Opani point at the Thames entrance, which is about 12 miles from Tapu, and 3½ miles from Tararu point.

A remarkable saddle in the ranges to the north-eastward will be seen on passing Tapu, which so long as it is open indicates comparatively deep water; when it closes in, a vessel will be close to the 3-fathom line.

From Tararu the shore line runs S.E. 2¼ miles to Shortland wharf at the entrance to Kaueranga creek, along which are the goldfield towns of Grahamstown and Shortland. The principal or goods wharf is at Grahamstown, extending out about 1,800 feet, which dries outside the end several hundred feet at low-water springs: at high-water springs there is a depth of 9 to 11 feet alongside it.

LIGHTS.—On the end of Grahamstown wharf are shown three lights in a triangle—upper *red*, the two lower white—which can be seen from a distance of 7 miles in clear weather.

A *green* light is shown from the passenger wharf, which is a short distance above the goods wharf, visible only a short distance.

The soft mud bank, on which coasters usually lie, appears to be extending seaward. About three-quarters of a mile off Tararu point there is a depth from 10 to 12 feet at low water, with the flagstaff on Tararu hill bearing N.E. Timber is brought to the wharf from the Shortland saw-mills up the Kaueranga creek. Vessels drawing 5 or 6 feet can load at Shortland wharf inside the creek in smooth water.

RIVER THAMES (*Waiho*).—Opani point, the western entrance point to this river, lies nearly South 1½ miles from Shortland point. The eastern shore is nearly a continuation of the coast line from Tararu point to Kaueranga creek, on to Kopu, the lower anchorage within the river entrance, where its banks are about 4 cables apart; at Opani they are 9 cables apart. The approach to the low lands of the river Thames is known by a dense white pine forest on its west bank, 2 miles within its mouth; and the white mission house on the east bank, elevated 75 feet.

The bar, which extends 3½ miles from the River mouth, and 2¼ from Tararu point, the nearest part of the east coast, has 4½ feet at low-water and 15 feet at high-water springs. When the right extreme of the pine forest bears S.S.E. ½ E., and the mission house East, a vessel is on the bar, and Opani, the west entrance point, will bear S.E. by E. ¾ E. The channel thence to the river is straight, one-third of a mile wide, with a depth of 2 fathoms at low water, which depth can be carried to Kopu, 2 miles above Opani, and close to which shore the channel runs; one-quarter of a mile within Opani point is a shoal of 4 feet, but having a depth of 12 feet in the channel.

Anchorage.—Vessels can anchor at Kopu in 12 to 15 feet at low water, where there is good landing. Vessels of 100 tons can reach Turua at half-tide, 5½ miles from Opani; here again is anchorage in 2 to 3 fathoms, but the channel is narrow.

From Turua the river turns suddenly to the eastward, and winds again southward 7½ miles, and there is not less than 4 feet at low water: here is the junction with the Hikutaia. From Hikutaia to Opita, 10 miles, the channel has not more than 2 feet at low water, and the tide may be said to end here; one mile beyond Opita, the channel is 100 feet wide. The banks of the river Thames are of very soft mud.

" Vessels bound to the river Thames, which is not considered fit for vessels drawing over 14 feet water to enter, should keep about 3 miles off the eastern shore, and when Tararu point bears N.E. by E. they will be close to the Fairway buoy, black and white, in 4½ feet at low water, and nearly 4¼ miles N.W. by W. ¾ W. from Opani point; or, if the buoy be away, when near the first bearing bring the willows at Kopu just open to the eastward of Opani point, and steer in over the bar E.S.E. till well up to the first beacon on the eastern side, passing two black buoys—on the edge of the Swatchway, and nearly three-quarters of a mile westward of a shell bank, nearly awash at high water, which stretches across the bank eastward towards the mangroves on the eastern shore—on the port hand; thence to the lower anchorage at Kopu, which is considerably sheltered from the sea by the shell bank above mentioned. There is a small wharf at Kopu. About 1½ miles above the willows at Kopu are the Telegraph towers, one on either side of the river, 90 feet high; above which about 1½ miles at Orere are some sawmills. This is considered the second or river anchorage, where vessels can lie in from 9 to 14 feet at low water. Above this the river narrows and becomes winding. Local knowledge or a pilot is necessary to proceed above Kopu."*

Tides.—It is high water, full and change, at Opani point at 7h. 35m.; rise of tide 10 feet, strength of tide 3 knots: at Turua 7h. 59m., and at Hikutaia 8h. 34m., with a rise of 8 feet.

Strong northerly winds send the water in, strong southerly the contrary, making the tides both in height and time uncertain.

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* Brett's New Zealand pilot, November 1880.

PIAKO RIVER, running nearly parallel with the Thames, has its entrance 2½ miles to the westward of that river; it is much smaller, and only navigable for boats at low water.

Landmarks.—Two telegraph towers, painted white, which are valuable landmarks, are situated at the entrance to Piako river, and can be seen from a distance of 9 miles.

Pukorokoro river.—The channel into Pukorokoro river has a depth at high water of 7 to 9 feet, staked roughly on each side; a buoy marks its outer extremity. There are coal mines in the vicinity.

DIRECTIONS.—Vessels from Auckland bound for Grahamstown or Kaueranga creek, through Waiheki channel, should, after passing Tarakihi islet, steer a S.E. course for 19 miles; or, in clear weather, by bringing Tarakihi islet on a N.W. bearing, steer from it, and on its peak disappearing, a depth of 4 fathoms at low-water will be found, stiff blue mud. This is a convenient anchorage with the white telegraph towers at Piako entrance open of each other, bearing S.E.; mount Two peaks, N.E. by N.; and Waimongo pah W.N.W.

If proceeding by the Ponui or Sandspit passage, Oreri point must be given a wide berth, to avoid the shoal water which extends from the point to the distance of a mile. Thence the outer anchorage is 11 miles distant.

Ships sailing up the Frith with westerly winds should give Waimongo pah a berth of 2 miles, as within that distance the winds will be found light and very baffling.

Anchorages.—During strong northerly or N.N.W. winds, the outer anchorage off the Thames bar is unsafe, as immediately on the wind blowing with any force from that direction, a very heavy swell rolls in. On the appearance, therefore, of such winds, the anchorages of Opopo bay, at Waiheki island, or Coromandel harbour should be resorted to. The first-mentioned is the better of the two, having the advantages of perfectly smooth water, excellent holding ground, a watering place (even in dry weather), and a smooth water communication with Auckland through Tehmaki strait.

Coromandel harbour from its shallowness in the thoroughly protected portions, does not afford equal protection to vessels drawing 18 feet and upwards, as they are obliged to anchor with the mouth of the harbour open to S.W. gales.

Southward of Ponui island, is not a desirable anchorage in any but fine weather—with westerly winds especially—as it blows very hard here when nearly calm under the high land above Waimongo pah.

CHAPTER III.

THE GREAT BARRIER ISLAND—COAST FROM CAPE COLVILLE TO EAST CAPE, INCLUDING THE ISLANDS AND ROCKS IN THE BAY OF PLENTY—EAST CAPE TO MAHIA, OR TERAKAKO PENINSULA—MAHIA PENINSULA TO CAPE PALLISER.

VARIATION IN 1883.

East Cape	13° 55′ E.	Cape Turnagain	14° 50′ E.

GREAT BARRIER ISLAND.

The Great Barrier island (*Otea*) situated on the eastern side of the Hauraki gulf, affords great protection to it from seaward. It is 21 miles long in a N.N.W. and S.S.E. direction, and 10 miles across in its widest part, which is about the centre: a range of mountains of considerable elevation extends through its whole length, almost without interruption. Mount Hobson, the highest, is clothed with trees to its summit, and rises to a peak from the central part of the island to a height of 2,330 feet. There is good pasturage for cattle in the valleys and on the slopes of the hills; on the eastern side of the mountain range is a considerable extent of plain land.*

The island is in parts thickly wooded; the kauri tree flourished at one time in great abundance on the high land; all within convenient reach, however, has been cut down and exported, or used for ship-building purposes. Small vessels are built and repaired at port Abercrombie, and in 1848 a vessel of 400 tons was built and equipped there, and carried away a cargo of copper ore from the mine which was then being worked at the northern end of the island.

The Moko-hinou and Fanal islands, with their outlying dangers, the Navire and Simpson rocks, already described (see page 19), lie from 14 to 16 miles westward of the north end of Great Barrier island. Little Barrier island (*Houtourou*) lies 8 miles westward of its central part.

The Horn rock lies nearly in mid-channel between the great and little Barrier islands, bearing from the south-east end of the latter, E. by S. ½ S. 4 miles; from False head of Great Barrier island, S.W. ½ W. 5¼ miles; and from the Pirogue rocks, W. ¼ S. 7 miles. There are 12 or

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* *See* Admiralty coast chart, sheet II., No. 2,543; scale, $m = 0 \cdot 3$ inches.

13 fathoms close to it, and from 25 to 30 fathoms in the passages on either side; it breaks when there is any swell.

WEST COAST, GREAT BARRIER ISLAND.—On the western side are several bays and harbours, for the most part open to westerly and south-west winds, but affording excellent shelter from easterly. They are, commencing from the northward, Catherine bay, ports Abercrombie and Fitzroy, Wangaparapara harbour, Okupu bay, and port Tofino.*

The northern extreme of the island is a high peninsula, one mile in length, connected with the main by rocks, through which the sea washes; several high pinnacle rocks stand off the extreme, whence named Aiguilles, or Needles point.

From Needles point, the western coast trends S.W. by S. 5¼ miles to Miners head, the north point of Catherine bay; the summit over this head is a conical hill, resembling a beehive, and is a productive copper mine. There is a small cove immediately south of Miners head, where coasters anchor in fine weather and ship the ore: a rock awash at high water lies in the centre of it.

Catherine bay.—The south head of this bay, Separation point, is nearly 3 miles S. ¾ W. from Miners head, with a remarkable pillar rock standing off it; there are 25 fathoms water across the entrance, and it runs to the eastward for 2½ miles, narrows very rapidly, and terminates in two sandy coves, separated by a narrow peninsula. On the north side of the bay, a quarter of a mile from the shore, and nearly a mile W.N.W. of the peninsula, is a large flat rock (Bird rock), always awash, with a passage of 4½ fathoms between it and the shore. There are 12 fathoms between this rock and the south shore, and good anchorage half a mile south-east of it, with all winds from North, round by east, to S.W., in 6 and 7 fathoms sand and shells.

Coasters may get shelter from westerly winds in a cove on the south shore, three-quarters of a mile S.S.E. of Bird rock, in 5 fathoms sandy bottom, midway between the west point of the cove and the peninsula extreme; but if the wind should come from the north-west a vessel should immediately work over to the north side of the bay, and anchor under Bird rock, between it and the main in 5 fathoms. The coves at the head of the bay are shallow a short distance within the peninsula extreme.

Port Abercrombie is 1½ miles south of Catherine bay. Selwyn island, 2 miles in length east and west, lies in the entrance, and is separated on its south side from the main island by Governors pass, which is scarcely half a cable wide, with 10 fathoms water through it; from seaward, it appears as part of the main island. Immediately westward of Selwyn island are two smaller islets, about a cable apart, bold and steep; the outer bluff of the westernmost is the remarkable headland, known as Wellington head, and forms the southern entrance point of the port. N.E. by E. half a mile from this head is a reef of rocks, which must be passed to the northward; between the reef and the head is a small islet.

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* *See* Admiralty chart, ports in Great Barrier island, No. 2,559; scale, $m = 2 \cdot 0$ inches.

The entrance to port Abercrombie is about 1¼ miles broad, with 30 fathoms water across; it is entirely open to westerly winds, and the general depth, 14 to 20 fathoms, is too great for convenient anchorage, except in Nagle cove.

Nagle cove is a small but secure anchorage immediately round the north head, where several coasters might lie in safety, and with room for two vessels of the size of sloops of war, when moored; Oyster islet lies in the centre of it. The depth of water is from 7 to 9 fathoms; here was the ship-building establishment; fresh water and fuel may by obtained without difficulty, and also numerous wild goats in the neighbourhood.

Tides.—It is high water, full and change, in Nagle cove at 6h. 25m.; springs rise 10 feet, and neaps 7 feet.

Port Fitzroy,* the inner harbour of port Abercrombie, is an extensive sheet of water, well sheltered from all winds. Its entrance, which is 1¾ cables in width, with a depth of 20 fathoms in it, bears E.S.E. 1½ miles from the north entrance point of port Abercrombie. As this entrance is bounded by high land on either side, flaws and violent squalls of wind will generally be met with in passing through; a quarter of a mile within, the harbour opens out to a general width of nearly half a mile, and extends for nearly 3 miles to the southward, with two bays branching off to the eastward about a mile in depth; 1½ miles within the entrance, the depth of water is 14 fathoms, mud bottom. When the narrow channel south of Selwyn island (Governors pass) opens-out, the harbour expands to a width of nearly a mile, and with this pass again shut in, there is good anchorage, borrowing on the western shore, in 6 and 7 fathoms, mud bottom.

A rock with 6 feet on it at low-water lies E. by S. ½ S. half a mile from the south-east end of Selwyn island, with Governors pass just open; this pass is only fit for boats, and has a rock under water (Paget rock) in its outer entrance.†

The flood tide sets out of the pass westward, and the ebb in.

False or Bald head bears S. by E. ½ E. 3¼ miles from Wellington head, and much resembles it in appearance and character; it is also the westernmost of a group of islands which lie off the main island, leaving a passage between, 1¾ cables wide in the narrowest part. Within the line of these two remarkable heads are several small scattered islands; a vessel may work freely among them, as there are no dangers but what may be seen:—30 fathoms will be found 2 miles off shore, and 10 fathoms within half a mile of this part of the coast.

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* Information on this derived from Remark book, Staff-Commander Osborne, H.M.S. *Nelson*, 1882.

† Governors passage, though only 178 feet across at the narrowest part, is practicable for steam vessels, as the sides are steep-to, like the entrance to a dock, and the narrows short in extent.—Captain Hope's Remark book, H.M.S. *Brisk*, 1865.

Pig islands.—Good anchorage for small vessels may be obtained in the passage between these islands and the main, in 4 fathoms, off the pebble beach on the centre island, nearly out of the tide, and sheltered from all winds but north-west, which would cause a swell to set in; 3½ fathoms is the least water in this channel at low water, but two rocks awash lie half a cable off the south-eastern point of the centre island. A chain of three steep rocky islets almost connected, and between which the sea is always breaking, lie parallel with and to the eastward of the southernmost Pig island; they extend off the point of the main island southward for half a mile, and a fourth islet of the same character, projects westward at right angles to the southern one. There is deep water between the Pig islands and this chain, and the width at the southern entrance is 3 cables; a rock which breaks, lies a cable S.E. of the fourth islet, and another, which also breaks, a quarter of a mile to the eastward of the three.

To the eastward of the rocky islets the coast recedes, forming a bay, which meets within half a mile of the southern arm of port Fitzroy, but there is no shelter or anchorage in it.

The south side of the southernmost Pig island is a steep perpendicular cliff, with a conical islet, equally inaccessible, lying immediately off it. Passing outside this island, 25 fathoms will be found close-to, and Cliff island, a high steep wedge-shaped islet, with a sharp peak on its south end, will be seen bearing E. ¼ S. 4 miles distant; Cliff island is more than a quarter of a mile from the shore with a smaller islet within; it may be passed close on its outer side in 21 fathoms.

Wangaparapara harbour lies a little more than a mile to the eastward of Cliff island, running in a N.N.W. direction one mile, with a width of 3 cables. This is a snug little anchorage with all winds, except those between S.S.E. and S.W.; in a cove immediately inside the western entrance point is the best anchorage, in 4½ fathoms.

Pirogue rocks, three bare flat-topped rocks high above water, resembling boats under sail, and covering the space of a cable, lie off this part of the coast, and may be seen for several miles. They lie from the western head of south Pig island S.E. ½ E. 3 miles, and from Cliff islet S.W. 2¼ miles; deep water will be found close to, and 22 fathoms between them and the shore.

Okupu bay, one mile south-eastward of Wangaparapara harbour, is one mile wide at the entrance, and runs to the north-east 1½ miles, with from 9 to 7 fathoms in it, and 3 fathoms within a quarter of a mile of its head, which terminates in two sandy coves; a considerable stream empties itself into the southern one. Okupu bay is entirely open to winds ranging from south to west, and is not recommended as an anchorage.

Port Tofino is the southern harbour, and lies S.S.E. 2½ miles from Okupu bay: the coast line between is straight and bold, with 15 fathoms a quarter of a mile distant. A small islet lies a quarter of a mile from the shore, half a mile before reaching the north head of the port; close off the north head is a high-peaked islet, and immediately over the head a remarkable conical peak.

The entrance heads lie W.N.W. and E.S.E. 2 miles apart; at the inner north head—a high cliffy peninsula—the entrance contracts to 1½ miles in width, the harbour running for the same distance in a N.E. by N. direction. Three-quarters of a mile inside the peninsula, a flat rock (Bird rock) lies a quarter of a mile off the north shore, nearly connected with it by a reef.

Anchorage.—Between Bird rock and the head of the harbour, there is good anchorage off the north shore in 6 and 7 fathoms, with all northerly and westerly winds; from easterly or south-east gales, a cove in the south-east corner of the bay affords excellent shelter in 4 and 5 fathoms, mud bottom; this cove is immediately eastward of a high rocky peninsula point on the south side of the harbour, and small vessels might anchor far enough in to be sheltered from south-west winds.

Soundings.—Inside a line between the peninsula point on the south shore and the Flat rock on the north, the depths are from 9 to 10 fathoms, and outside it from 12 to 18 across the entrance.

Caution.—Port Tofino is a favourite anchorage with the coasters; the ebb tide, however, which runs to the south-east along this side of Great Barrier island, sets strongly out of the harbour, and a vessel working in from the southward, unless with a fresh breeze, is liable to be drifted out, —the water being too deep to anchor,—and swept through the passage between capes Barrier and Colville.

Rock.—Half a mile south of the southern head of port Tofino, is a rock which does not always break, and between it and the shore another sunken one; 20 fathoms will be obtained a very short distance outside these rocks.

Cape Barrier, the south-east extreme of the island, is 2½ miles East from the south point of Tofino harbour, and midway between projects what appears a peaked island, but is connected with the main by a low neck. Rocks extend a cable off cape Barrier; and two, detached and breaking, lie 3 cables to the eastward of it: there are 28 fathoms, sand bottom, one mile off the cape; within that distance the bottom is rocky. Vessels rounding this cape are recommended to give it a berth of 2 miles.

EAST COAST, GREAT BARRIER ISLAND, is destitute of harbours, and, unless after westerly winds, there is generally a heavy swell setting on it. From cape Barrier, the coast trends north 2¼ miles; a small high steep islet lies close off the shore one mile from the cape; it then runs north-west 5 miles, where there is a sandy bight but no anchorage; from this bight the land again trends to the northward 4 miles to the easternmost projection, a bluff rounding cape.

Arid island.—Northward from this eastern cape, 2 miles distant, is Arid island, bold and cliffy, with landing on its western side in fine weather; it is 1¾ miles long in a north and south direction, and one mile broad; off its eastern side, and extending to the eastern cape, are four small conical islets, all steep-to.

The coast from this east cape recedes to the westward 4 miles to a sandy bay which extends in a north and south direction 2 miles:—this bay is immediately abreast Catherine bay, and the width of the island here is about 2½ miles, with an easy track across. There are 14 fathoms sandy bottom in the bay one mile from the beach, and 13 fathoms rocky bottom between Arid island and the east cape: a vessel might anchor in this bay with westerly winds if necessary; off its northern point are two small islets, and the coast then trends N.W. by N. 5 miles to Aiguilles or Needles point.

Soundings.—Three miles eastward of the east cape there are 45 fathoms mud, and to the southward is the same depth, fine dark sand. One mile outside Arid island there are 29 fathoms, sand bottom.

Tides.—The flood tide, entering cape Colville passage, sweeps to the north-west along the western side of Great Barrier island as far as False head; it is there met by the flood stream which enters the Hauraki gulf from the northward, and causes during springs confused ripplings both off False and Wellington heads.

There is very little tide felt on the outside of Great Barrier island; the flood tide runs to the northward.

COAST FROM CAPE COLVILLE TO MERCURY BAY.

CAPE COLVILLE.—The pitch of the cape is the north-eastern point of a sandy bay one mile in extent, which lies in the north-west angle of the peninsula, with a reef of rocks extending nearly three-quarters of a mile to the northward of it. The tide races are strong off cape Colville, and vessels are recommended to give it a berth of 1½ miles, should they pass between it and Channel islet (*Takoupo*), which bears from the cape N.N.W. ¾ W. 2½ miles; but, unless with a commanding breeze, it is recommended to pass northward of Channel islet.

Cape Barrier, the south-east extreme of Great Barrier island, bears from cape Colville N.E. ½ N. 11¼ miles, and between these capes is the eastern approach to the Hauraki gulf.*

CUVIER ISLAND, which bears from cape Colville E. by N. ¾ N. 21 miles, is 1½ miles long in an east and west direction, and rises to a rather remarkable peak; it is visible from a considerable distance, and serves as a finger-post to the channel.

From cape Colville the land trends E. by N. ½ N. 3½ miles to a similar rocky headland; W.N.W. from which, half a mile distant, is a rocky islet similar in feature to Channel islet. The coast then runs south-eastward, nearly 4 miles to Charles cove, a small bay running to the south-east, but exposed, and not desirable even for coasters, as from shoal water they cannot enter sufficiently far for shelter. It is, however, frequented by them for timber cut at the Auckland Company's mill. Half a mile to the north-west of the eastern head of Charles cove is a small islet, and the coast continues its south-easterly trend 4 miles further to a cliffy point. Three miles S. by E. of this cliffy point is Waikawau bay and river, both unimportant and unsheltered; three rocks above water lie half a mile off the coast, 1½ miles south-eastward of the bay.

KENNEDY BAY (*Aratuhu*) is distant 4 miles from Waikawau; its entrance, which is half a mile wide, bears from the north-west end of great Mercury island S.W. ¼ W. 9½ miles; it affords fair anchorage for small vessels in 4 and 5 fathoms, with westerly winds round from north to south. There is a sawmill here, and is visited by small coasters for timber.

Rock.—N.E. ½ N. from the outer south-east cliffy point of this bay, three-quarters of a mile, is a rock awash; there are 6 and 7 fathoms between it and the shore.

South-eastward of Kennedy bay are two sandy beaches, each about a mile in extent. Round the cliffy south head of the southern beach is Wangapoa river, fit for coasters, having 5 feet water on its bar at low water; this river has been used by vessels of 250 to 300 tons, but the entrance is narrow and the tides strong; a commanding breeze is necessary and a local pilot should be obtained; Harris' sawmills are here, and there is a large export of timber. The south point of this river is sandy, and a sandy beach extends for 2 miles to the eastward of it.

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* *See* Admiralty coast chart of New Zealand, sheet II., No. 2543; scale, $m = 0 \cdot 3$ inches.

From Wangapoa river the coast trends N.E. by E. ¾ E. 8 miles to Tepaki point, which is nearly 4 miles to the north-westward of the north entrance point of Mercury bay: off this point lie the Mercury islands.

MERCURY ISLANDS (or D'Haussez group).—This group consists of four principal with several smaller islands, as also low reefs and rocks interspersed among them; they occupy a space of 10 miles from north-west to south-east, and the same distance from east to west.

GREAT MERCURY ISLAND (*Ahou-ahou*) is the largest, being 4½ miles long W. by N. and E. by S., and nearly 3 miles broad at its southern part; it is steep and cliffy on the northern and eastern sides, with its highest summit towards the south-east end. On the west side is a deep bay, with anchorage in 5 fathoms in its north-east part in fine weather; this bay renders the island very narrow in the centre.

Danger.—A sunken rock about 150 feet in diameter, with 4 feet on it at low-water spring tides, lies in the fairway entering Mercury island cove, which is in the north-west corner of the bay, where small coasters lie, from which the extreme south-west point of the island bears S. by E. ¼ E., and the inner of the two rocks at entrance of bay W.S.W. These rocks in one lead nearly over the danger.*

Rock.—The south-east end of Great Mercury island is 6 miles to the northward of the north point of Mercury bay; its north-west end bears from Cuvier island west extreme S. by E. 8½ miles, and from the eastern part of cape Colville E. ¾ S. 18 miles; a rock 20 feet high lies half a mile N.E. by N. from the north-east point of the island.

RED MERCURY ISLAND (*Wakahu*), 3 miles in circumference, is the outer or easternmost of the group; it lies 4 miles eastward from the south-east end of Great Mercury island.

Richards rock, a dangerous rock, which uncovers only at low springs, lies N. by W. ¾ W. 1¼ miles from the north cliffy point of Red Mercury island; from the south-east end of Cuvier island, S.E. by E. 11½ miles; and from the north-east end of Great Mercury island, E. by N. 7 miles; this outlying danger has deep water round it, and only breaks occasionally.

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* Reported by Mr. W. Simpson, late master of the revenue cutter, *Ringleader*.

Captain McGillivray commanding the S.S. *Go-ahead*, whilst at anchor in the entrance to the cove, sounded over the bay, and found a detached reef with about 2 feet on it at low-water springs, lying one cable off the western entrance point of the cove; but the sunken rock reported by Mr. Simpson, he was unable to find.

Caution.—Between the Great and Red Mercury islands are the islands Kawitihu and Korapuki, with several smaller islets and some low reefs; south of Korapuki, nearly a mile, are two rocks awash; the passages between this group of islands should be avoided.

OHENA, the southernmost island, lies N.E. by E. ½ E. 2½ miles from the north entrance point of Mercury bay. Two low reefs bearing from N. by E. to N.E. extend from one to 2½ miles off its north extreme; and north-west of it are two small low islands 20 feet high, three-quarters and 1½ miles distant respectively.

Old Man rock situated W. ⅓ N. 1⅔ miles from Ohena island, is about 80 yards in diameter and 200 feet high; it forms a valuable mark for steam coasting vessels navigating between Auckland and the eastern ports of New Zealand.

Sunk rock on which there is a depth of 7 feet, lies 2 cables N.E. by N. from the sunken danger, which lies off the south-eastern point of Opito bay, and situated E. by S. 2 miles from Tepaki point, in the channel between Old Man rock and the mainland.

There is also another rock nearly awash at low water, in a line between the south-east point of Opito bay and the Koruenga islets.

KORUENGA ISLETS.—Half a mile from the north entrance point of Mercury bay are the steep gray islets, named Koruenga, 150 feet high, the outer islet being known as the Needle.

MERCURY BAY.—This large inlet, 30 miles south-east of cape Colville, is 5 miles wide at its entrance, and affords anchorage during westerly winds in sandy bays on its north and south shores, and is the seat of a considerable timber trade. Cook's bay, on the south side, at the mouth of the Oyster river, is the preferable anchorage. At the head of Mercury bay, in the south-west angle, is Mangrove river, a snug anchorage and secure from all winds.*

Directions.—Mercury bay may be approached from the northward or westward, either by passing outside the Mercury islands, and entering between them and the Alderman islands, or by hugging the coast; the latter is often preferred for the sake of keeping the weather shore on board, and always by coasters and steamers.

If the outer passage is taken, there are no dangers which are not visible, except Richards rock before described, which must be carefully avoided, lying as it does in the track from cape Colville; between the Mercury and Alderman groups are depths of 40 fathoms, decreasing gradually to 20 fathoms across the entrance of Mercury bay.

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* *See* Admiralty chart, Mercury bay, No. 2,574; scale, $m = 2 \cdot 0$ inches.

The approach to Mercury bay by the inner passage is between Great Mercury island and Tepaki point, a channel 3 miles wide. Tepaki point has some small islets off it, and is the north-west point of a sandy bay (Opito), where there is good anchorage with winds from N.W. through west, to S.E. Vessels unable to get round cape Colville, will find shelter in the north-west part of the bay, observing that foul ground extends a short distance southward of Tepaki point. Pass midway between Great Mercury island and Tepaki point, and when Ohena island is open half a point of Old Man rock, steer for the latter passing it on its south-west side, which is bold close to. Half a cable south-east of Old Man rock is a rock awash at low water.

To clear Sunk rock (*see* page 97) to the eastward, which lies off the south-east point of Opito bay, the hole in the Needle (Koruenga) should be kept closed, as open it leads on to the rock. Having passed this danger and Old Man rock, steer between Ohena and the Needle; the latter has some rocks adjoining, but it may be passed at the distance of 2 cables.

Twins.—Having passed Koruenga island, the Twins, a double conical islet 1¼ miles within the bay, will be seen; this islet is steep-to.

Koranga island lies 1¼ miles south-westward of the Needle, stretching at right angles from the shore about 4 cables, with an islet off its extreme.

Matapaua bay lies about three-quarters of a mile to the westward of the islet, having 5 fathoms, sandy bottom; off the west point of this bay a ledge of rocks extends one-third of a mile towards the Twins; after this the north shore is clear to Buffalo bay.

Middle island in Mercury bay (*Motu-korure*) has foul ground off its north-east and south-east extremes for 2 cables, but is bold to the westward.

Tower rock (*Moturoa*) rises abruptly to a height of 188 feet, within one mile of the southern entrance point, and has also foul ground 2 cables round it.

Sunk rock is situated one-quarter of a mile northward of the outer islet in approaching Mercury bay from the southward, seldom showing, but which occasionally breaks; there are from 9 to 13 fathoms round it. It bears N.W. ¼ N. six-tenths of a mile from the north-east point of Te-tui or Mahurangi, the island forming the southern entrance point of the bay, and E. ¾ N. 1$\frac{3}{10}$ miles from Tower rock. When the coast line to the southward of Mahurangi is opened out, a vessel will be clear of Sunk rock to the eastward.

The passages among these islands about the southern entrance should be avoided.

There are no other dangers in Mercury bay than those which have been mentioned, until Shakspeare cliff is passed; the soundings decrease gradually, there being 10 fathoms on either side of Middle island, and 3½ to 4 fathoms up to Shakspeare cliff, off which a vessel may anchor, with the cliff bearing from South to S.S.E., but should not proceed higher,—unless intending to enter Mangrove river,—to avoid the Pandora rock of 8 feet, and some detached banks of 9 and 12 feet, which extend nearly half a mile from the shore between Shakspeare cliff and the east entrance point to Mangrove river.

Mangrove river.—To enter Mangrove river, steer midway for Buffalo beach, at the head of the bay; by keeping the Twins just open of Koranga islet, bearing N.E. ¾ N., Fly bank is avoided (the north-westernmost of the shoal banks just noticed), and when the eastern entrance point of river bears S. by E. the banks will be passed, haul gradually up towards the mouth, till Red hill is on with high Pah point, (within the entrance on the eastern side,) which leads clear of the Spit off the western beach before reaching Hukihuki, the low Pah point; then keep the eastern point on board in passing, and anchor 3 cables inside it in mid-channel. It is desirable to moor a little above the saw-mills.

The river above high Pah point is navigable for vessels drawing 8 or 9 feet to the upper saw-mills, about 6 miles above.

Water.—Fresh water can be procured round the high Pah point, and there is a carpenter's yard near the anchorage, where ships have been repaired.

A steam saw-mill is situated at the entrance, and another about 6 miles up the river. These mills employ from 60 to 70 Europeans, two-thirds of the number being at work in the bush felling trees.

During the two years 1871 and 1872 about 2,000 tons of Kauri gum were shipped from the bay, but the gum is now reported to be nearly worked out.

Gum town, situated about 9 miles up Mangrove river, contains three or four stores belonging to the Kauri gum traders. When the supply of gum ceases this settlement will probably be abandoned. The township has a good pier available for vessels of light draught.

Oyster creek, although of considerable breadth, is hardly navigable for canoes.

Tides.—It is high water, full and change, at Mangrove river at 7h. 21m.; springs rise 7 feet, and neaps 5 feet. The tides must be considered in entering Mangrove river, and vessels should go in at last quarter flood: it would be better to be there about slack water, for there is no room to round-to, and the tides run from 3 to 4 knots. The least water in the channel going into the river at low-water springs is 14 feet, at high water 21 feet.

Mangrove river causes the tides in Mercury bay to be scarcely perceptible on the south shore; but on the north shore, at springs, they run 1½ knots; this can be taken advantage of in working in or out.

Pilot.—If on the approach of an easterly gale it is required to run for Mangrove river, it should be taken as soon as possible, for the sea rolling into the bay would break across the shoaler parts of Buffalo bay; one of the builder's men at the entrance of the river might act as pilot if required.

The northern shores of Mercury bay are wooded, the treble peak rising above Mahungarape is 1,026 feet high; the south shore is barren and uncultivated. A long flat country extends from Buffalo bay to the high ranges over Coromandel harbour.

Captain Cook's observations on Mercury bay show the remarkable changes that have taken place during the last years in the formation of the coast, as well as in the decrease of the native population. He describes and leaves a sketch of a rock connecting Mahungarape and the main, with the arch under it, and above, a Pah. It still exists, and in similar shape, but has dwindled to such a small sharp rock, that where the Pah stood, a man could now only sit as on a horse. Similar effects have taken place on Shakspeare cliff, which is fast supplying rocks to the depths below; indeed, the whole coast here is more than ordinarily perforated, and one cave on the north shore was penetrated to 400 feet, having there a depth of 4 fathoms.

BAY OF PLENTY.

The Bay of Plenty is the name given to the long extent of coast comprised between Mercury bay and cape Runaway, near the East cape: a line drawn between these two points measures 110 miles, and the greatest depth of the bay from such a line is about 40 miles. There are a number of islands and detached rocks in this extensive bay; the only anchorage in it of importance, and which offers shelter for any vessel larger than a coaster, is Tauranga harbour; the coast trends from Mercury bay S.E. by S. towards this harbour, a distance of about 55 miles.*

Castle island (*Ngatutu*), a small steep islet lies S.E. by E. ¾ E. 4 miles from the north-east point of Mahurangi island; it is 50 feet high, white in colour, and steep-to; 39 fathoms will be found 3 cables distant.†

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* *See* Admiralty coast chart, sheet III., Mayor island to Poverty bay, No. 2,527; scale, $m=0{\cdot}25$ inches.

† A heavy break was observed by Capt. McGillivray about 2 miles eastward of this island during a north-east gale, 1880.

Alderman islands are a group of small islands, with off-lying rocks; they lie E.S.E. 14 miles from Mercury bay, and are about 9 miles from the nearest part of the mainland.

These islands are here noticed as being contiguous to the coast, but will be more fully described hereafter, together with the various islands in the bay of Plenty. See page 113.

Tairua river.—Ten miles southward of Mercury bay is Tairua river, available only for coasters; the intermediate coast is broken into sandy bays and cliffy points, with from 20 to 14 fathoms water one mile off shore.

Shoe island, when seen from the north-west, exactly represents its name, even to the tie; it lies E.N.E. from the north cliffy head of Tairua, (which is easily recognised by having two nipples on it), 1½ miles distant, and is about one mile in circuit; it has a small coasters' harbour, with 6 feet at the entrance. Half a mile eastward of the island are some black rocks above water.

Slipper island, so called from its shape, lies E.S.E. 4 miles from Tairua head, and 2 miles off shore; it is nearly 2 miles long north-east and south-west, having two small islets off its south end, connected with each other and the island by a reef awash at high water. The outer islet is near the extreme of the reef, which is 1¼ miles from the island. A rock, about 15 feet high, lies nearly a quarter of a mile southward of the reef, which may be passed within the distance of a cable to the southward by vessels taking the inshore passage. If from the southward, having passed this rock, when Shoe island begins to open of the rocks which lie S.W. 1¼ miles from the north end of the island, and off which bearing North 2 cables is a sunken rock which breaks heavily, steer midway between it and Tairua head.

Vessels can ride out a north-easter by anchoring to the westward of the south end of Slipper island in not less than 5 fathoms, under this depth the water shoals suddenly.

For shelter from a south-easter anchor in the bay farther north, abreast the house, in 6 fathoms.

S. by W. ½ W. 3¾ miles from Slipper island is the Warekawa stream, at the southern termination of a sandy beach, 2½ miles long.

Whangamata river is 5 miles southward of Warekawa stream; its north entrance point is cliffy, the south is a sandy point, with a round cliffy islet (Clarke islet), projecting from it. South-east of this islet, at distances of half a mile and one mile, are two smaller islets, the Wedge and Sugar-loaf. The two entrance points of the river project so as to form a bay outside, where a vessel may anchor with off-shore winds in 4 fathoms, half a mile from the shore, with the entrance open. Whangamata river bears West from Mayor island 17 miles distant, and from the south end of Slipper island, South 8 miles; the coast is free from danger, having 30 fathoms 6 miles off shore, decreasing to 9 fathoms within one mile of it. From Whangamata river to Kati-kati river is 16 miles, with no dangers on the coast between them.

Kati-kati river.—The entrance, which has only 1½ feet on the bar, bears from Mayor island S.W. by S. 15 miles; on the north side of the river is a sandy bay nearly 5 miles long, and the coast to the southward, between it and Tauranga harbour, is a straight sandy beach 13 miles in extent.

Te-ho, the north head of Kati-kati, is 170 feet high; 2 miles east of it the water shoals suddenly from 6 to 3½ fathoms, and breakers extend one mile from the entrance, which appears to be choked with banks; there is, however, a narrow channel on either side of a middle ground at the entrance, with not less than one fathom at low water, and deep inside. No reliable directions can be given owing to the shifting nature of the bar.*

The Kati-kati river expands to a considerable width within, and is connected by one of its arms with Tauranga harbour, affording a channel for boats, and which is also used by small steamers of light draught, at high water, thus forming a long sandy island between Te-ho and mount Maunga-nui; at low water this channel is nearly dry.

Karewha.—E. by S. ½ S. 7½ miles from Te-ho head is the small rugged island Karewha, 350 feet high: it lies 3 miles off the sandy beach, with a channel between of from 10 to 13 fathoms, sand and shells. Maunga-nui, the hill at the entrance to Tauranga, lies S.E. by S. 6 miles from it.

TAURANGA HARBOUR, which, as before stated, is the only harbour on the east coast between Mercury bay and port Nicholson that affords shelter in all winds for vessels of burthen, is 13 miles south-eastward of Kati-kati river; its entrance lies South 19 miles from the south end of Mayor island, and W. ½ S. 11 miles from the south end of Motiti island.†‡

Signals.—For the New Zealand general harbour signals, see page 15.

The difficulty of entering this harbour through the deepest channel is its somewhat tortuous course, and the liability to eddy winds on rounding mount Maunga-nui, the channel in one place being only half a cable wide; but with those winds which would make the bay of Plenty a lee shore,

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* Captain Carey of the steam ship *Keera*, reports that, in 1872, the bar on which was a depth of 18 feet at high water neap tides, was 1½ miles seaward of Te-ho head; to enter, Te-ho head should be brought to bear W.S.W., then steer directly for it, keeping that course until within a quarter to half a cable of the head, then follow the land about the same distance until inside, where there is plenty of room, with 7 or 8 fathoms water.

† *See* Admiralty chart, Tauranga harbour, No. 2,521; scale, $m = 8\cdot0$ inches.

‡ Recent information on Tauranga is derived from Brett's New Zealand pilot, 1880.

Tauranga harbour is the most accessible, and when once inside there is anchorage for a fleet.

The entrance to the harbour lies nearly north and south; the eastern head is the remarkable flat-topped hill Maunga-nui, rising abruptly from the sandy shore to a height of 860 feet, which makes like an island from seaward; the western entrance is formed by low undulating sandhills. One mile north-westward of Maunga-nui, a spit with 9 feet water extends eastward from the western sandy shore for one mile, and generally breaks.

The Approach to Tauranga harbour is remarkably distinct. Vessels bound to it from the northward should bring the south end of Mayor island to bear North, steering a South course; on this course Karewha will be passed on the outside about 3 miles distant, in 23 fathoms, when the islet Motu-otau, and a hummocky projection from the sand, both within one mile eastward of mount Maunga-nui, will be seen; these are the only interruptions to an uniform sandy beach extending eastward 15 miles to Maketu; the soundings decrease gradually after passing Karewha island, from 15 to 6 fathoms within one mile of the heads.

Directions.—Vessels about to enter the harbour must bring the summit of Maunga-nui to bear South, and not eastward of S. by E., and then steer for it until within 2 cables of North rock, thereby avoiding the bank extending from the west shore; the channel is one-third of a mile wide, and deepens from 3½ to 7 fathoms. As Maunga-nui is steep-to, keep about 1½ cables from it until between the black buoy on the eastern side of entrance, and the red buoy on the western side; from thence steer so as to pass within 30 yards of the beacon on Stony point and haul close round it. The channel here, although the deepest, is not much more than half a cable wide. After Stony point is passed Maunga-nui is again steep-to, and a good anchorage will be found in 5½ fathoms in the first sandy bight, Pilots bay, a cable from the shore; vessels should moor here. Should the black buoy be, from any cause, removed, the mark for hauling round towards the beacon is the island of Motu-otau, seen over the sandy flat just clear of Maunga-nui.

Caution.—It is the opinion of those well acquainted with Tauranga harbour that no attempt should be made to enter until slack water, or nearly the last of the flood tide, as owing to the sharp turn at Stony point and the strength of the tide, vessels are liable to be set on shore on either side, before there is time for the helm to take effect; vessels of moderate length and good steam power that steer well may, perhaps, afford to disregard this caution. Baffling winds will nearly always be met with under Maunga-nui.*

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* Navigating Lieutenant W. J. Symons, H.M.S. *Wolverene*, 1878, observes, "The best time for large vessels to enter is at about 20 minutes after high water by the shore, as the tidal stream runs for at least 40 minutes after high and low water."

Buoys.—The western side of the channel abreast Stony point is marked by two red buoys; the outer one lies in 5½ fathoms, and marks the north end of the Inner Middle bank, which extends one-quarter of a mile in a north and south direction, with 2 feet at low water; and the second red buoy, in 4½ fathoms, is at the entrance of the inner waters leading to Kati-kati.

The southern side of the channel within Stony point is also marked by three red buoys; whilst above on the same side of channel, the eastern edge of the main bank opposite Maketu mound is marked by two pile beacons.

An experienced pilot is employed to look after the buoys, but none of them can be depended upon. The harbour, from the Outer Middle bank to the sand-hills north of Whareroa, was re-sounded and buoyed in 1879.

After northerly and easterly gales, the bar breaks right across from the Outer Middle bank to Maunga-nui bluff for some hours.

Vessels of any size can proceed a mile above Maunga-nui, carrying from 5 to 7 fathoms water, by keeping about a cable off high-water mark on the left-hand shore, or midway between it and the red buoys marking the bank on the opposite side, which is steep-to, and will almost always show distinctly. There will be seen a small rise of ground on the left-hand shore, Maketu mound, immediately above which the channel divides, one arm running to the westward with irregular soundings, and the other continuing towards Te-papa, the Mission station. There is good anchorage off Maketu mound in 5 to 7 fathoms.

Buoy.—A red and black buoy marks the fairway between the two streams; and vessels, except of light draught, should not anchor above it.

Upper channels.—Above the fairway buoy are two channels to Tauranga, the principal, close to the eastern shore, has the greatest depth, but with a very sharp bend; having passed between the buoys at the narrows, haul up for the cemetery at Te-papa Mission point, till the black buoy off the sulphur works is passed, whence keep about a cable off that shore till abreast the town, and anchor in 2½ fathoms. There are two wharves at Tauranga, with berthage for vessels drawing 16 and 12 feet respectively.

The other channel, Stella passage, is more to the westward and marked by two black buoys and one red, and has nearly a foot less water in it than the main channel. It is advisable for vessels of moderate draught to wait for nearly high water, there being a depth of only 8½ feet at low water in the shallowest part of the main channel. H.M.S. *Rosario*, drawing 14 feet water, has frequently been up the harbour at spring tides, as far as Te-papa.

Anchorage.—There is another anchorage near the entrance to Tauranga harbour, which is reached by steering from abreast the outer red buoy, which marks the northern end of the Inner Middle bank, so as to pass half a cable westward of the second red buoy, when steer for the R.C. Church at Otumoiti, which leads between the sand extending north-eastward from Pani-pani beach and a shoal bank to the south-eastward, passing Pani-pani point one cable distant; thence along the western shore until Maunga-nui is shut in, when anchorage will be found in 6 fathoms sand, half a mile beyond the point, and about a quarter of a mile off shore.

After passing the second red buoy, the water shoals to 2¼ fathoms, until near the anchorage, when it deepens from 3½ to 6 fathoms. The channel between the sand-banks off Pani-pani, before mentioned, is very narrow; strangers therefore, if unable to obtain a pilot, should be very cautious in using it. From this anchorage vessels can leave without detention, whereas within Maunga-nui bluff, the prevailing wind being westerly and the channel off Stony point very narrow, a ship may be detained.

Mission.—Above Te-papa there is only a boat channel amid extensive flats, and 3 miles above, it narrows again into a small but deep river, running to the southward, which is navigable for boats for 15 miles, and by it a journey can be accomplished to the Roto-rua lakes in less than two days. Te-papa is the Protestant Mission station; the site is well chosen on elevated ground, on the south side of the harbour, 3 miles from Maunga-nui; 2 miles westward of it is Otumoiti village, where there is a Roman Catholic mission establishment.

A large tract of land of superior quality in this district was in 1874 being settled under the public works and emigration scheme, and promised to be the most successful settlement in the province.

The total native population of the Tauranga district was in 1854 estimated at 1,000.

Water.—Fresh water can be obtained just within Stony point in small quantities.

During the twenty-three days H.M.S. *Pandora* was at anchor in Tauranga harbour (in the month of November) it blew very fresh, and almost continually from the south-west, but such strong winds were considered unusual.

Tides.—It is high water, full and change, at Tauranga at 7h. 10m.; springs rise 6 feet, and neaps 4½ feet. The strength of the tide at springs is 3 knots; in the narrow channel at Stony point it may attain 4 knots.*

The coast from Tauranga harbour, which is a uniform sandy beach, runs E. by S. ½ S. for 15 miles to Kaituna river. The land between is low and covered with fern, with the exception of two hill ranges of 600 and 800 feet, which rise one mile inland and extend to the south-west. A remarkable flat-topped range of hills, about 1,000 feet high, rises 10 or 12 miles inland of Tauranga, and extends in a north-westerly direction.

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* Captain Fremantle, H.M.S. *Eclipse*, says that, at half an hour before low water, the ebb tide runs between 4 and 5 knots at Stony point, and the ebb stream runs out more than an hour after low water.

Motiti island lies 4½ miles off this sandy coast, with 12 fathoms water midway between it and the shore. See page 114.

Kaituna river.—Town point (*Okure*), the east head of Kaituna river, is a cliff 100 feet high; from it towards Motiti and Plate islands the ground is very foul, but the passage between is taken by steamers and coasters. The entrance of the river is very narrow, with only 3 feet on the bar at low water: within, it expands considerably, and is navigable for boats 8 miles up. This river carries the surplus water from the Roto-rua lakes to the sea.

Just within the entrance of Kaituna, on the south-east side of the river, is the large Pah of Maketu. W.S.W. of the river entrance, at distances of 3 and 5 miles, three remarkable clumps of trees will be seen rising out of the low land.

Waihi and Matata rivers.—One mile south-eastward of Town point is Waihi river, which runs in many branches through an extensive flat.

E. by S. ¾ S. 16 miles from the same point is Matata river, with a straight sandy beach the whole way. There are three streams between the Waihi and Matata rivers, the principal of which is Waitaha-nui 9 miles south-eastward of the former, fordable at low water; on its bank, half a mile inland, is the conspicuous native Pah of Otamarako.

At Matata river, coasting vessels are built. From it a range of hills runs south for 12 miles, forming the western boundary of an extensive plain which lies between that river and the Whakatane; this range of hills is only separated from the foot of mount Edgcumbe by the narrow valley through which the Awaote-atua river flows; the river, after winding through the plain along the eastern side of the range, becomes a branch of the Matata.

The white cliffs coastwise north-westward of Matata rise to a height of 500 feet.

MOUNT EDGCUMBE (*Putanaki*) rises abruptly from the plain (of which it is the southern boundary) to the height of 2,575 feet; it is 14 miles south of Matata river, and on the summit is said to be a lake of green water, probably the old crater of a volcano.

Eastward of Matata river, 13 miles, is the Whakatane river, with an extensive swamp at the back of the sand-hills which skirt the coast between them, and the plain of fern and flax before mentioned as extending to the foot of mount Edgcumbe.

WHALE ISLAND (*Motu-hora*) and **Ru-rima rocks.**—Off this part of the coast is the island Motu-hora and the Ru-rima rocks; the former is N.W. by N. 5 miles from Whakatane river, and the rocks lie West from Motu-hora 4 miles; there is a passage 2¾ miles wide between them and the shore, with soundings varying from 9 to 11 fathoms. See pages 115, 116.

WHAKATANE RIVER.—Kohi point, the north-east point of this river, is 637 feet high, and has been covered with several pahs, the ridges and ditches of which have a curious appearance. The channel into this river is between large boulder rocks just covered at high water; these rocks are on either side of the bar, which at low water has only 2 feet on it, and 9 or 10 feet at high-water springs.

Whakatane river is a favourite port for the coasting trade. Schooners reach as far as Pupuarue, the mission station, 3 miles up, whence the river bends to the south-east, and flowing through the hill ranges at the back, takes the name of Orewera.

The Matata and Whakatane rivers are connected by the Orini, the stream of which is constantly running towards the latter, and is navigable for boats; it runs parallel with the sandy beach about 1¼ miles from it.

Ohiwa river is 7 miles eastward of Kohi point; it is broad at the entrance, being half a mile across at high water; within, it branches into three arms running through extensive mud-flats; the bar, one mile seaward, is shifting and unreliable, the depth on it varies from 9 to 14 feet; between the heads the tides run very strong.

Half a mile eastward of Ohiwa river is a wooded cliff about 500 feet high, which, as it stands alone on the coast, is a good guide to this river; and at 2¼ miles eastward of Ohiwa is the entrance to the Wai-otahi stream.

OPOTIKI RIVER is 6 miles eastward of Ohiwa; the entrance is not more than a cable across; both heads are sand, with no natural marks to lead in. The bar changes with freshes, and north-east gales also affect it, the depth varying, but the river is navigable for ordinary coasters for one mile inside. Opotiki divides into two branches half a mile within the points, both running to the southward, nearly parallel to each other, and about 2 miles apart; the Church mission is on the western branch, 1¾ miles from the mouth; this river is in the depth of the bay of Plenty; and 7 miles eastward of it, the long extent of almost straight sandy coast may be said to terminate at Opape point.*

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* The channel of Opotiki river is marked by moveable beacons. Captain Fremantle, H.M.S. *Eclipse*, 1866.

Soundings off coast.—The general depth of water from Kaituna river to this part of the coast, at 10 miles off shore, is 30 fathoms, mud bottom; and at 5 miles, from 18 to 21 fathoms, sand.

Tides.—It is high water, full and change, at Opotiki river at 7h. 0m.; rise 7 feet. The flood tide runs to the westward along the coast from one to 2 knots per hour.

Features of coast.—From Opape point the coast trends N.N.E. 22 miles to Waikaua point, and its features are strikingly changed, being now broken into numerous small sandy or shingle bays with rugged cliffy points between.

Three miles from Opape point is Pehetaire point, 800 feet high; east of which one mile, is the large double-fenced pah of Tunapapoa. The ground here shelves very gradually, having 18 fathoms, mud bottom, 5 miles from the beach.

Nearly 8 miles further north-eastward,—with three bays between,—is Koronohina point, 240 feet high, and round it is built the large village of Tokata. One mile south of Koronohina point is the small river Maraenui, expanding during freshes to half a mile in width, but in dry weather fordable half a mile from the mouth: its bar is 30 feet wide, and close to the shore; it is a tolerable boat harbour, having 8 feet water within.

Omaio village.—From Koronohina point to Opokohino point and the village of Omaio is 2½ miles, with a rugged coast between. The peak over Opokohino point rises to 600 feet: the village is a large one, and is built on the bank of a stream of the same name, immediately eastward of the point.

Te-kaha point is 5 miles further to the north-east; there are two bays between, and extending off the middle point which separates them is the small peninsula of Motu-nui, where coasters haul into 5 fathoms and ride out north-east winds. The bay south-west of Motu-nui is shingle, and two small rivers empty themselves into it; the larger one is the Omaio.

Awanui river is 2½ miles north-eastward of Motu-nui, with a rocky shore between; it is visited by small coasters. From this river the coast turns sharply north-westward 1½ miles to Te-kaha point with a rocky shore.

Te-kaha point has outlying rocks half a mile round it; hence to Waikaua point, an old whaling station, is 4 miles; mid-way between them and half a mile off shore is a reef awash, to keep clear of which, steer outside the line of the points. There are high wooded ranges a short distance inland on this part of the coast; mount Hardy, S.E. by E. ½ E. 8½ miles from Te-kaha, rises to a height of 3,700 feet; also a coast hill immediately east of Waikaua point, 860 feet high.

From Waikaua point to Orete, the southern point of Wangaparawa road, is N.E. ½ E. 9 miles; the first half of the distance, as far as Kotiki point, the coast is steep and rugged, with 35 fathoms mud bottom 2 miles off shore, decreasing to 20 fathoms at the same distance towards Orete point; for the remaining distance there are shingle beaches and rocky points, with three villages, and the small Rau-kokore stream.

Immediately westward of Orete point there are sunken rocks three-quarters of a mile from the shore, and the ground is everywhere foul within half a mile of the coast.

Tides.—It is high water, full and change, at Te-kaha point at 6h. 30m.; springs rise 9 feet.

CAPE RUNAWAY, the eastern termination of the bay of Plenty, and easily known by its dark colour and oval shape, appearing almost like an island, is 6 miles north-eastward of Orete point, and forms the north-east point of Wangaparawa roadstead; detached rocks lie a quarter of a mile northward of this cape, with 20 fathoms water near to, and 6 fathoms between them and the land. E.S.E. from these rocks is another rock awash at low water; it is recommended to give this cape a good berth as the tide runs strong in its vicinity, and there is generally a swell.

Tides.—It is high water, full and change, at cape Runaway at 9h. 16m.; rise 7 feet.

Wangaparawa roadstead.—With south-east winds there is anchorage in this roadstead off what was a whaling station situated 2 miles S.S.E. of cape Runaway. Large vessels should not approach the shore within a depth of 12 fathoms, anchoring about one mile west of the conical hill over the station, south of which one mile distant is Wangaparawa, a fordable stream, winding through a vast plain towards Hicks bay. Up to this stream the coast is rocky, and it is difficult to effect a landing: beyond it there is a shingle beach 1½ miles long, and then about the same extent of white cliffs 80 feet high, having terraces of fine table land on their summits. A ledge of rocks extends nearly half a mile off the south end of these cliffs, and thence a sandy bay to the long low point Orete.

Caution.—Upon the slightest appearance of a westerly wind, a vessel should not remain at anchor off the whaling station; and although well sheltered from a north-east wind, it would be dangerous to attempt to ride a breeze out from that direction, for these winds always shift to the northward and westward, and would bring in such a heavy sea as to render it very difficult to gain an offing.

The anchorage under Orete point, about half a mile within it, affords excellent shelter in south-west and westerly winds, by bringing the outer extreme of the rocks extending off it to bear W. by N., and anchoring in from 10 to 7 fathoms, fine sand. A great objection, however, to the anchorage in Wangaparawa roads is, that between the changes from south-east to westerly winds, there is frequently a calm, the westerly wind being preceded by a swell, and coming in flaws. H.M.S. *Pandora* was thus placed in a critical position on two occasions, during the survey.

CAPE RUNAWAY to HICKS BAY.—From cape Runaway, the north point (*Matakawa*) of Hicks bay, bears E. ¾ N. 16½ miles; including the former cape, there are three points of land between, of the same formation, and therefore readily mistaken for each other, as in sloping seaward from the mountain ranges, they rise to a small peak before they again fall away in the same direction. Lottin and Midway points, the latter the eastern part of the same projection, and only 1¼ miles distant, have this feature; there is a small sandy bight west of the former, and one east of the latter, but neither have anchorages.

LOTTIN POINT is 9 miles eastward of cape Runaway; in making the land from the northward, this part of the coast may be distinguished by a peak to the southward, which will be seen much higher than the general range, and by the land being higher to the westward of Lottin point than towards Hicks bay. The hills bordering the coast are steep, and clothed with thick brushwood one-third of the way from their summits; their elevation varies from 1,000 to 1,500 feet high.

Caution.—The depth of water is considerable; should the wind fail there is no anchorage on this part of the coast, and a constant swell sets towards it.

Soundings.—Soundings in 20 fathoms will be obtained 2 cables off shore, and 40 to 50 fathoms within one mile.

HICKS BAY, 1½ miles deep and the same in width, is open to the eastward. The north point, Matakawa, is a long low rocky tongue of indurated sandstone, with a crust of scoria; the rocks off it are all visible, and there is 25 fathoms water within one cable of the entrance. The south point, Kohau or Iron point, is almost inaccessible; it forms the division between Hicks bay and the long bay of Panaruku to the south-eastward.

Anchorage.—Hicks bay affords secure anchorage in all westerly winds from north to south; from north winds also, which are not uncommon, it is sheltered, but vessels must get well within Matakawa point; the bottom is greenish mud and good holding ground, shoaling suddenly towards the sandy beach at the head. The north and south shores are very steep, generally faced by perpendicular cliffs and outlying rocks; the latter within half a cable of high-water mark.

North-east gales, which generally spring up from the eastward and gradually freshen, give sufficient warning to weigh. No vessel should lie here with north-east or south-east winds. From south-east winds, which are much more constant on this part of the coast than in the Hauraki gulf, vessels may be sheltered by standing down towards the white cliffs, which are 5 miles south-eastward of Hicks bay, anchoring in from 9 to 12 fathoms in Kawa-kawa roadstead, 1½ miles westward of the Awatere river, and within one mile of the beach, where a vessel will be in a better position to proceed to sea, on the wind changing to the eastward, than if anchored in Hicks bay.

Tides.—It is high water, full and change, in Hicks bay at 9h.; rise 7 feet.

Awatere river is 3½ miles S.E. by E. from the south point of Hicks bay, at the eastern extreme of the sandy bay of Panaruku. Nearly a mile to the south-west of it is a table-hill 900 feet high, and about the same distance to the south-east is a hill of 1,100 feet elevation.

Water.—Fresh water can be obtained in Hicks bay from a gully within half a mile of Matakawa point; difficulty will be experienced in landing if the wind blows fresh outside, from a swell rolling into the bay; there is also a considerable stream of fresh water, 5 or 6 feet deep, in the north-west corner.

Supplies may be obtained from a native village (Wharekahika) in the south-west nook of the bay. The natives catch the hapuka fish off Kohau point; just within this point is a very small but deep cove, used by the natives as their best landing place, except the whaling station one mile from Matakawa point, where the isolated rocks form a boat harbour.

From HICKS BAY to the EAST CAPE.—From the north point of Hicks bay to the East cape islet, is E. by S. ¾ S. 14 miles.

Soundings.—The soundings 5 miles off this part of the coast are from 40 to 50 fathoms sand, which decrease rather gradually to 14 and 10 fathoms within one mile. Across the entrance of Hicks bay and Kawa-kawa roadstead there are from 14 to 17 fathoms, and no dangers but what are visible.

The land about the East cape has a very mountainous appearance; the summits of five distinct ranges may be seen backed by the snow-capped Ikaurangi, a conspicuous mountain, rising to the height of 5,530 feet, 28 miles south-west of the cape. The cape itself is of a remarkable white clayish sand, and this barren feature is continuous to Hicks bay in steep cliffs to the westward, and in broken cliffs with valleys intervening to the southward.

EAST CAPE ISLET.—This islet, half a mile in circuit, is a type of the cape, with but a small proportion of stunted verdure; it is steep, almost inaccessible, and bounded by rocks, with a ledge extending from its northern extreme, N.N.E. half a mile.* When the western points trending to Hicks bay are well open, the islet anchorage will be found in 16 fathoms, within 2 miles of it; and when the weather admits, a vessel might ride out the tide to great advantage.†

The water deepens again to the southward, until within one mile of the islet, when it will be found to shoal suddenly to 12 and 9 fathoms; the latter depth will be carried to within one cable of it. There is a channel nearly one mile wide between the cape and the islet, but as the winds here are liable to die away suddenly, leaving a vessel at the mercy of the tides and swell, it cannot be recommended.

There are several shoal patches off East cape, which, together with the strong tides, make the passage between the cape and the islet not a desirable one. A shoal patch with 3¼ fathoms water on it, on which the sea would break in heavy weather, lies off the north-east point of the cape about two-thirds of a mile; this is the line of breakers reported by H.M.S. *Eclipse* in 1864; there is another patch, nearly a mile S.E. ¾ S. of the former, with 2¼ fathoms water on it, at the entrance to the passage between East cape and the islet.

Winds.—The winds on either side of the East cape are frequently very different, although it may be blowing fresh. The strong westerly sea breezes which blow through the bay of Plenty are suddenly lost when passing south of East cape islet, the distinct line of breeze being curiously depicted on the water, and a vessel may be becalmed here for hours in sight of strong breezes. As there is usually more or less swell, a vessel should be guarded on approaching the shore.

Tides.—It is high water, full and change, at East cape at 8h. 55m.; rise 7 feet. Northward of the East cape the flood tide sets to the westward, and southward of the cape it sets in a northerly direction 2 to 3 knots.

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* There is said to be sunken rocks 2½ miles E. by N. of the East cape, but I believe it arises from the race being very heavy.—From Commander Drury's Remark book, 1856.

† There is good anchorage on either side of the cape, which is very advantageous for vessels going either way, as the wind generally blows along the land, therefore they can always get a smooth anchorage. As it came to blow in strong squalls this evening from the S.E., anchored in 7 fathoms, about 5 (? 2½) miles westward of East Cape island, about one mile off shore; the soundings are pretty regular, on a sandy bottom.

Sounded the bay where we are lying and found it free from all danger, and the soundings gradually decreasing to two fathoms close to the beach: this bay is sheltered from all winds from south-east to West. The tides here are moderate, the flood running to the westward.—From the Remark book of Captain Hayes, of H.M.S. *Driver*, 1846.

ISLANDS AND ROCKS IN BAY OF PLENTY.

The islands in the bay of Plenty commencing from the northward are, the Alderman group, Shoe and Slipper islands, Mayor island (*Tuhua*), Karewha, Motiti, Plate island (*Motu-nau*), Whale island (*Motu-hora*), and White island (*Whakari*), with the Valkner islets.

The detached rocks are, Ru-rima near Whale island; the Astrolabe reef, and Schooner rocks, the former to the northward and the latter to the eastward of Motiti.

ALDERMAN GROUP is a cluster of basaltic islets scantily vegetated, with some outlying rocks resembling the stumps of trees; four of these islets extend in an E.N.E. and W.S.W. direction about 3 miles; one mile southward of this group is the largest islet, being little more than 1½ miles in circuit, and about 150 feet high.

Two rocks above water, and one awash, lie 2½ miles N.W. from the eastern islet, as also two others at distances of 1½ and 2½ miles W. by N. from it; there is also a rock out of water, half a mile eastward of the southern islet. Including these off-lying dangers, the Alderman group occupy a space of 4 miles from north to south, and 3 miles from east to west, and may be seen from a distance of 10 to 15 miles. They are 9 miles from the nearest mainland (north head of Tairua river), with a depth of 25 fathoms in mid-channel between, but very steep-to to seaward, there being 100 fathoms less than 2 miles distant.

The eastern islet when seen from a distance makes like a sharp pinnacle rock, and bears from the outer or Red Mercury island S.E. ¾ S. 21 miles.

Shoe and Slipper islands.—South-west 7½ miles from the southern Alderman is Slipper island; it is 2½ miles from the mainland, and has been already noticed in describing the coast: the Shoe, a small island lying 1½ miles E.N.E. from Tairua river, has also been described before, page 101.

MAYOR ISLAND (*Tuhua*) is S.E. ¾ S. 19 miles from the southern Alderman, and 14 miles from the mainland, with 50 fathoms in the deepest part of the channel between, and 40 fathoms within one mile of the island.

This island is 7 miles in circumference, or 2½ miles long, north-west and south-east, and 1½ miles in breadth; its northern peak is 1,100 feet high: the centre is an extinct crater, open to the south-east, with stagnant water at the bottom; the western face of the island is covered with blocks of obsidian, giving it a remarkable dazzling appearance when reflecting the sun's rays. On the south-east extreme is a pah, strongly defended by a deep cut or pass, partially artificial, through which invaders must approach, as the other sides have steep cliffs down to the water.

Immediately west of the pah is a bay, where temporary anchorage may be had with sandy bottom; but as it is open to west and south-west winds it would be seldom available beyond a few hours, during which a small quantity of provisions and water might be obtained: on the east side of the pah is a small cove, where coasters ride in northerly winds.

Rock.—One mile east of the pah point is a rock under water, which breaks with a moderate swell; it is half a mile from the nearest or south-east point of the island: close off the north point is a small sugar-loaf islet; the rest of the island appears perfectly clear of danger.

Karewha island (*see* page 102).

MOTITI ISLAND is flat, and triangular in shape: it is 3¼ miles long north to south, and 1½ miles from west to east. Its greatest elevation, 190 feet, is at the northern end, which bears from Mayor island S.E. ¾ S. 19 miles, and from mount Maunga-nui E.N.E. 11 miles; the rest of the island is not more than 100 feet above the sea.

Dangers.—The distance between the south end of Motiti island and the mainland is 4½ miles, with 12 fathoms, sand, in mid-channel: there are two tidal rocks which dry 4 feet at low water, E. by S. 1¼ miles from the south end, and another rock awash, between them and the point.

A shoal forming a narrow ridge, with from 2 to 4 fathoms on it, deepening to 10 fathoms rather suddenly to the southward and eastward, and more gradually to the westward, extends from the south end of Motiti island for about a mile in a S.W. by S. direction.

Okorapu reef.—A dangerous rocky patch, with about 5 feet on it at low-water spring tides, lies in the fairway of vessels passing between Motiti island and Astrolabe reef, bound to or from Tauranga. The patch is about 70 yards in extent, and from it mount Maunga-nui bears S.W. by W. ¼ W. 9 miles, and the north point of Motiti island E. ½ S. 2½ miles.*

Schooner rocks, named from their likeness to a small craft at a distance, are 4 miles E.N.E. from the north-east end of Motiti island: these rocks are scarcely one cable in extent, of bold approach, and 62 feet high; there are soundings in 40 fathoms between them and Motiti, and a rock also is reported to exist.

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* Captain McGillivray reports having seen two heavy breaks about 2 miles to the westward of Okorapu reef, and about one mile apart, on the same day that Tokeroa shoal south-west of Plate island was seen breaking, when a heavy sea was running from the north-east.

A rock about three-quarters of a mile N. by E. ¼ E. from Schooner rocks has been seen breaking.

Astrolabe reef, detached and uncovered at low-water springs, lies North 4 miles from the north end of Motiti island; the whole extent of the danger is not more than 2 cables, extending E.N.E. and W.S.W., and would break almost always, but as it is covered at high water, in very fine westerly weather it might not show.*

H.M.S. *Pandora's* boats found 20 fathoms all round the rock at 50 yards distance, and the ship passed 2 cables from it, sounding in 30 to 40 fathoms green mud and broken shells.

Clearing marks.—At the rock the flat summit of Maunga-nui hill is exactly on a level with the ridge of the table-land behind it; if a vessel is inside the rock, Maunga-nui hill will appear above the distant land, and if outside it will appear below.

From Astrolabe rock Maunga-nui hill bears S.W. ½ W.; centre of Mayor island N.W.; and the right extreme of Motiti island S. ¼ W.

Caution.—This neighbourhood should be avoided at night, as Motiti island is low, and there is no other land near enough to be a guide.

Plate island (*Motu-nau*), so named from its hollowness in the centre, lies E. by N. 7 miles from the south end of Motiti, and S.E. ½ S. 3½ miles from Schooner rocks, with from 20 to 40 fathoms water between them.

The island, 166 feet above the sea, is less than half a mile in extent, and has deep water all round it, except off the south end, where there is a ledge just above water.

Tokeroa shoal.—A rocky patch, about three-quarters of a mile long in a north-east and south-west direction by half a mile broad, lies south-westward of Plate island. The least water found on it was 3 fathoms, with the south extreme of Plate island bearing N.E., distant 1½ miles.

WHALE ISLAND (*Motu-hora*) lies 28 miles E. by S. ¼ S. from Motiti island; it is 5 miles N.W. by N. from Kohi point (Whakatane river), and 4 miles from the sandy shore of the mainland, with a depth of 13 fathoms inside it. The island is 1,167 feet high, 1½ miles long east and west, and three-quarters of a mile from north to south; it appears bell-shaped from seaward, but on nearing it a second peak is seen on the west end.†

H.M.S. *Pandora* anchored under a shingle spit off its south-west end, and there is no reason to doubt that with good ground tackle a vessel might ride out any gale here. The island being small, the back swell would be considerable, but at all events it is the only spot affording any shelter in this portion of the bay of Plenty, in case a vessel should be caught in a north-east wind, and not able to hold her own. At the anchorage there are 6 fathoms, but small vessels may get close in under the shingle beach: abreast of the anchorage is a boiling spring. Goats are numerous, and there is some cultivated ground, but no residents. Fresh water is scarce.

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* "This rock," remarks Commander Drury, "is in such a very different position from that assigned to the Astrolabe reef, that were we not convinced that no rocks exist in the position of the Astrolabe, I should have hesitated to give it this name."

† There is said to be a sunken rock 2¼ miles N.E. of Motu-hora; we searched for it in vain.—From Commander Drury's Remark book, 1856.

Ru-rima rocks are a dangerous cluster, lying to the westward of Whale island, some high above water, and others awash. The easternmost portion is one mile in extent, east and west, and half a mile north and south, the highest rock being 120 feet above the sea, and about 300 yards in circumference: this rock lies W. ¼ S. from the north end of Whale island distant 4 miles.

Detached patches extend to the northward, westward, and south-westward or towards the mainland; taken together, they cover a space of 2½ miles from east to west, and 3½ miles from north to south. The inner rocks extend to within 3 miles of the beach, the outer being 6 miles from it; both are awash, and there are 18 fathoms half a mile north of the outer ones. Vessels passing inside should keep the shore on board, which shelves gradually, there being 11 fathoms in the deepest part of the channel; these rocks, like Whale island, retain volcanic heat.

WHITE ISLAND (*Whakari*), an active volcano, in latitude 37° 30′ S., and longitude 177° 12′ E., lies off the depth of the bay of Plenty, 26 miles from the shore. It is about 3 miles in circumference, and 860 feet high; the base of the crater is one and a half miles in circuit, and level with the sea; in the centre is a boiling spring about 100 yards in circumference, sending volumes of steam 2,000 feet high in calm weather; round the edges of the crater are numerous small geysers, sounding like so many high-pressure engines, and emitting steam with such velocity, that a stone thrown into the vortex would immediately be shot into the air.*

Here and there are lakes of sulphureous water dormant; but the whole island is heated so as to make it difficult to walk; from the edges of the crater, the scene below is only to be compared to a well-dressed meadow of gorgeous green, with meandering streams feeding the boiling cauldron; but on approaching, it is found to be the purest crystallized sulphur. No animal or insect breathes on the island, scarcely a limpet on the stones, and 200 fathoms will hardly reach the bottom within half a mile of its shores.

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* The following is the description of a visit to White island, from the Remark book of Mr. A. Thomas, Master, H.M.S. *Falcon*, Nov. 1st, 1866. In the afternoon hove to, and landed on White island. At the landing-place, which is on the south-east side of the island, there had been a slight landslip, probably resulting from the shock of an earthquake, reported to have been felt in the district of mount Edgcumbe a short time previous to our visit. The boiling springs instead of being in the centre of the crater as formerly have shifted to the north and inner end, while in the crater there is now a lake comprising a mixture of sulphureous and salt water; myriads of sea birds, principally gannet, were seen on the north-west side of the island, also a few dwarfed bushes.

This island is the eastern limit of that extensive belt of subterranean agitation which extends from mount Egmont through Tongariro, the Taupo and Roto-mahana lakes, to Whale island and the adjacent rocks Ru-rima, north of which line earthquakes are rarely felt.

Off the south-east extreme of White island is a rugged islet about 30 feet high, half a mile from the shore; there is not the slightest appearance of any off-lying danger, and scarcely any tide is felt.

Valkner islets are three rocky islets, from 80 to 150 feet above the sea, lying 3 miles N.W. by W. from White island. H.M.S. *Pandora* passed between them and the island, without striking soundings, with 60 fathoms of line.

FROM EAST CAPE TO MAHIA, OR TERA-KAKO PENINSULA.

The coast from the East cape to Open bay (*Waipiro*), a distance of 21 miles, trends S. by W., varied by white streaked cliffs, with sandy beaches intervening, the country being more or less cultivated; the soundings 4 miles off the land are from 25 to 30 fathoms mud, and there are several rocks scattered along the shore within a mile.

Three miles south of East cape is Wakori bluff, a cliffy projection, the land over it being from 500 to 600 feet high.

WAI-APU RIVER is 6 miles from the East cape, flowing through a sandy beach; it is a considerable stream at high water, but the freshes come down with great violence, so as to render it unsafe as an anchorage even for the smallest vessels; it takes its rise under Ikaurangi mountain, traversing the various ranges and draining a considerable extent of country.

Anchorage.—H.M.S. *Sappho* in 1875 anchored off the mouth of this river in 7 fathoms, about three-quarters of a mile off shore, 5 miles southward of the East cape, with the cape bearing N. by E.; and the north entrance point of Wai-apu river W.S.W. This anchorage, affording shelter from off-shore winds, is much frequented by coasting vessels wind-bound.

Rock.—Between Wai-apu river and Wharariki point, about one mile from the shore, is a rock with 10 feet on which H.M.S. *Eclipse* struck, it bears N.N.E., 2 or 3 miles distant from Wharariki.

WHARARIKI POINT, nearly 4 miles south of Wai-apu river, is the south point of the Awanui stream, the land over it being 950 feet high; there are rocks extending for half a mile round this point, at 3½ miles south of which is Reporua village, at the southern end of a sandy bay, whence cliffs extend for 2 miles to the southward of the village. South-east one mile from the northern end of these cliffs, and one mile also from the beach are sunken rocks, with foul ground for half a mile outside them; between these rocks and the shore are 8 fathoms water, and there are only 10 fathoms 2 miles from the beach.

Landing place.—There is landing on the north side of Whararíki point behind the reefs extending from it; but as there are several sunken rocks in the passage which only break in a heavy swell, it cannot be recommended to strangers. The Maories make use of this landing in their whale boats when Wai-apu bar is unapproachable. A white house and some farm buildings mark the spot.

KAIMOUHU, a round head 670 feet high, 3 miles northward of Open bay, is the next headland. Sunken rocks extend off it for one mile to the eastward, and the same distance in a north and south direction; there are 4 fathoms close to them, and 17 fathoms 2 cables to the eastward.

OPEN BAY (*Waipiro*) will be known by Tawhiti hill, the highest on the coast, which rises 2 miles south of the southern head, and is 1,670 feet above the sea: the width of the bay is 4 miles from north to south, and little more than one mile in depth; there is a considerable stream (Waikawa) in the south-western corner of the bay, but the landing there is generally difficult.

In the middle of the bay, immediately north of the Pah, is a reef, a quarter of a mile from the beach; and close off the southern head is a small islet and some rocks.

Off the north point (*Matahau*) is another reef which extends northward for nearly one mile parallel with the beach, and a quarter of a mile off shore; within this reef boats can effect a landing, and whence produce is shipped; there are 9 fathoms in the middle of the bay in a line between the heads, and a rocky patch with 2 fathoms is said to exist in the north-west corner; another rock is said to exist one mile N.E. of Matahau point called by the natives Tokamonga. This bay can only be considered as a temporary anchorage, with off-shore winds.

The coast from Open bay trends S. by E. for 20 miles to Tolago bay (*U-awa*), the bays of Tokomarua and Waipari lying between. Some reefs lie off this part of the coast distant more than one mile, which will be noticed hereafter.

Soundings.—The soundings are regular, in 30 fathoms mud, 5 miles off the coast, decreasing to 20 fathoms sand within 2 miles of it.

TOKOMARUA BAY is distant 3½ miles from the south head of Open bay:—the coast between is composed of precipitous cliffs, backed by Tawhiti, the hill before noticed. East of this hill, and half a mile from the cliffs, is Mowhiauru islet, about 30 feet high, and encircled by rocks.

Koatunui is the north cliffy head of Tokomarua bay, and Mawai,—a sharp barren projection 400 feet high, with rocks extending a quarter of a mile off it,—is the south point; they are 4 miles apart, and the bay is 2¼ miles in depth. Two small rocks close together (*Hikutu*), awash at low water only, lie in the centre of it, distant 1¼ miles from the sandy beach, and N.W. ½ N. 2¾ miles from Mawai point; there is also a reef on the south side of the bay half a mile in extent, and one-third of a mile off shore, which is visible.

Soundings.—There are 16 fathoms water across the entrance, and 6 fathoms inside the Hikutu rocks, which latter have 14 fathoms all round them; but no vessels, except such coasters as know the channels among the rocks, should attempt this bay; it is moreover a very open anchorage.

St. Patrick's cove.—On the south side of Mawai point there was a whaling station in St. Patrick's cove, a small nook which is well sheltered for boats; it takes its name from a curious pinnacle, which, seen from seaward, appears like the gigantic figure of a man with his arms folded.

Waipari bay.—At 3¼ miles from Mawai point is Morahahi head, the north point of Waipari bay, which is 1½ miles wide, and the same distance in depth, with sandy shores. The north point, and indeed the whole of this bay, is rocky; three-quarters of a mile, north-eastward of the north head is the small rocky islet of Motu-ripa, with a narrow channel of 5 fathoms between it and the shore. Anaura island forms the south head of the bay; it lies a quarter of a mile from the shore with a boat channel between, and extends three-quarters of a mile in an easterly direction; it is sterile and precipitous.

Marau bluff is the next projection southward of Waipari bay; it is 7 miles southward of Mawai point, and 4½ miles northward of Tolago bay; a reef of rocks awash and always breaking (Tokamapuhia) lies rather more than a mile eastward of this bluff, and extends in a N.N.W. and S.S.E. direction for more than half a mile.

TOLAGO BAY (*U-awa*) is 1⅓ miles across, N.W. by N. and S.E. by S., from head to head, and about the same distance in depth; in it there is anchorage in all westerly winds ranging from north to south.

The north head rises to 400 feet, and the south to 890 feet, both composed of the white marl so conspicuous along this coast.

Sporing island, three-quarters of a mile long in a north and south direction, lies immediately off the south head of Tolago bay, with a fordable depth between. The island is surrounded by rocks; off the north and south ends they extend one-third of a mile.

The north head of the bay has an island off it (Motu-heka) which is also surrounded by rocks, and again north-east of the latter is a reef (Tatara) always breaking, its outer limit being 1¼ miles from the north head. There is a passage of more than a quarter of a mile between the reef and Motu-heka, with a depth of 11 fathoms.

Tolago bay is clear of dangers; there are 10 fathoms sand between the heads, shoaling everywhere gradually, and 5 fathoms within half a mile of the sandy beach. There is one part, however, where an anchor will not hold well, the ground being shingle and rock; this small patch is one-third the distance across from the south towards the north head, and it is better to anchor within this line. On the setting in of easterly winds, vessels should leave in good time, for the outer reef renders the beating out somewhat tedious.

Cook's watering cove.—Within the south head of Tolago bay is the cove where Cook watered, and beyond is to be seen the remarkable arch in the cliffs which he has described; several initials are cut on the rock, where the artificial well exists made by his crew; there is some difficulty in getting water during the dry season. Tolago bay has steam communication with Gisborne.

H.M.S. *Pandora* obtained provisions here better, and at a more reasonable rate, from Europeans and natives than anywhere else on this coast.

U-awa river.—At the head of Tolago bay is U-awa river, with a bar of 5 feet, which is said to be constantly shifting; coasters have occasionally entered it; the principal branch has its rise to the northward.

The river is navigable, when inside the bar, and has been ascended for 16 miles by a steam-vessel of 6 feet draught.

The population in 1873 consisted of 35 Europeans and 200 natives.

Motara bluff and islet.—Motara bluff, a cliffy point with an islet and some rocks extending a third of a mile from it, is 2½ miles S.S.E. of the south head of Tolago bay, and from it Gable-end Foreland (*Pari-nui-te-ra*) bears S. ½ W. 7 miles, the coast between having rocks extending at low water half a mile off shore.

CAPE GABLE, or GABLE-END FORELAND, so called by Cook from its having a glaring triangular face, appearing like the whitewashed gable-end of a house; this appearance is contracted when within 3 miles of the land, but seen from the eastward it is very prominent; there are two patches of detached rocks 1½ miles north of the cape, about three-quarters of a mile from the beach; and a small islet one-third of a mile south-east of it, with a reef extending half a mile in the same direction. A reef also extends south of the cape a distance of 2 miles.

Rock.—The steam vessel, *Star of the South*, in March 1865, is reported to have struck on a rock about 3 miles S.S.E. of Gable-end Foreland; from the rock Whangara islet bears W.S.W. about 3 miles.

From Gable-end Foreland the coast trends S.S.W. ¾ W. for 14½ miles to Tua-hina point, the north head of Poverty bay (*Turanga*); the shore between is rugged, with sterile hills rising to a height of 600 feet. Rocks extend a mile from the projecting points, having sandy bays within them, faced also by rocks.

POVERTY BAY (*Turanga*) is 5 miles in breadth from head to head, which lie north-east and south-west of each other, and are the southernmost white-coloured projections on the coast, until Table cape (24 miles further to the southward) is reached; the bay is nearly 4 miles in depth.*

Caution.—The South, or Young Nick's head, is 500 feet high, and has anchorage 1½ miles within it off Wero-wero river in 3½ fathoms, half a mile from the mouth, but it is advisable not to approach the shore nearer than half a mile in entering, as the ground is very foul, changing from 8 fathoms to 9 feet. The bottom, however, is not rock, but apparently composed of vast fragments of the pipe-clay cliff, which has from time to time slipped away—a common occurrence on this part of the coast, so liable to smart shocks of earthquake, and upon which the sea is rapidly encroaching.

The north head (*Tua-hina*) has also foul rocky ground, extending to the south-east for 2 miles; at this distance H.M.S. *Pandora* shoaled suddenly from 16 to 8 fathoms; the summit of Tua-hina point is 260 feet above the sea.

Tua-motu.—On the north side of Poverty bay, one mile inside the outer point, is Tua-motu, which appears an island, but is joined to the main at low water; off this peninsula a reef extends 2 cables to the southward, and between it and Turanga-nui river are rocks half a mile from the shore, the outer ones of which are covered or awash at low water; the bottom is sand, and the soundings decrease gradually from 12 fathoms across the entrance to 5 fathoms, half a mile from the beach.

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* The master of the ship *Excelsior* in 1873 states that the anchorage at Poverty bay is good, the ground being stiff clay, there is no fear of dragging, and from strong south-east winds, which are rare in summer, a ship loading in the bay could find shelter under Young Nick's head.

Dangers.—Hawea rock, on which a steam-vessel of that name touched when entering the bay in March 1879, lies with the following bearings:—Pah hill, N.E. ½ N.; and the south extreme of Tua-motu, E. ½ S.

Note.—Pah hill, 470 feet high, is conical, and situated about half-way up the bay on the north side, and these bearings place the danger about 1½ miles from the north shore of the bay.

A rock with 6 feet at low water is situated about 100 feet E.N.E. of Pinnacle rock. A buoy is moored in the vicinity of the latter, outside the beacons, in 2½ fathoms, which marks the position of both rocks.

Anchorage.—For communicating with Gisborne the best anchorage is in 7½ fathoms, about three-quarters of a mile south-west of the buoy. If bound to the river, the buoy should be brought to bear well to the eastward before hauling up.

It is recommended to weigh on any appearance of a breeze from the south-east, for from this quarter it freshens suddenly, and several vessels have been lost by waiting too long.

RIVERS IN POVERTY BAY.—There are three small rivers in the bay, Turanga-nui, Koputetea, and Wero-wero; the first named is celebrated as the place where Cook first landed in New Zealand; from the untoward circumstances attending his landing, and unsuccessful attempts to obtain provisions, he named the bay Poverty.

Turanga-nui river is 2 miles westward of Tua-motu peninsula, and is the northern termination of a sandy beach extending 8 miles from the south head; the soundings at the mouth of the river have during late years diminished. At the present time (1880), at high-water spring tides, there are 7 feet at the entrance, but being greatly protected from the easterly swell, which always rolls into the bay, light boats with care, in fine weather, can cross the bar at all times of tide. Stakes have been placed to mark the passage over the bar, which is close westward of the stakes. At high water coasting vessels and small steamers can, if the sea be smooth, cross the bar. Half a mile above the bar, the river branches off to the north-west and N.N.E. The depths vary at low water from 3 to 6 feet up to Reed's store, where the coasters lie.

Light.—From the flagstaff on the west side of Turanga-nui entrance, is exhibited, at an elevation of 38 feet above high water, a fixed *red* light, which in clear weather is visible from a distance of 5 miles.

Note.—The harbour-master reports that the best anchorage for steam vessels is with the flagstaff bearing N.N.E. in 6 fathoms; as westward of that line of direction the ground is rocky.

Water in abundance can be had within the banks of the river; in two places barrels have been sunk just above high-water mark, from which a plentiful supply of good water can be obtained.

Gisborne.—The rising town of Gisborne is situated on the right bank of Turanga-nui river, near the entrance, and in 1878 contained a population of 1,204. The land in this district is considered superior to that of Hawke bay. The stock of sheep and cattle is large and increasing. Steamers running between Hawke bay and Auckland call here for passengers and produce.

Koputetea river has about the same water on the bar as Turanga-nui, but is less easy to define; its entrance is N.W. ½ W. 2¾ miles from Young Nick's head, and may be known by a Maori village and a flagstaff on its north bank. It is a much larger river than Turanga-nui, and a fine sheet of water when the tide is in, and flows through one of the richest [illegible] about 30,000 acres of level land and

Poverty bay.—Information has recently been received of the existence of a small rocky shoal near the anchorage in the northern part of Poverty bay. This shoal, having a depth of 3¼ fathoms, and 6 fathoms close to, lies with Tua Motu bearing E. by S. ½ S., and the flagstaff at the entrance of Turanga-nui river N. by E. ⅜ E., distant 1¼ miles.

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Tides.—[illegible] 6h. 5m., rise of tide 6 feet. The flood tide outside sets [illegible], the ebb to the southward, and their influence extends 10 miles from the shore; within Poverty bay the tide is scarcely perceptible.

Soundings.—From Young Nick's head, Poverty bay, to the neck of the Mahia peninsula, a distance of 19 miles, the coast is bold, and may be approached as near as convenient; 24 fathoms will be found at 2 miles from the shore, and 10 fathoms at one mile; but there is no landing until reaching Mahanga, which is within half a mile of the neck.

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* Alterations and additions concerning Poverty bay are from the Reports of Captain J. Moresby, R.N., 1873.

ARIEL ROCKS, a very dangerous outlying reef, which breaks only in heavy seas, lies E. ⅝ N. 10 miles from Tua-hina point, the north head of Poverty bay; S.E. by E. ½ E. 8½ miles from False Gable, (the nearest point of land); and S. by E. ¼ E. 12 miles from Gable-end Foreland. At low-water spring tides it has on the shoalest part a depth of 12 feet; this dangerous portion is less than half a mile in extent in a north and south direction.

Soundings.—The Ariel rocks are steep-to, shoaling at one cast from 23 to 6 fathoms within half a cable of the shoalest part; there are 31 fathoms, green mud, between it and the shore, and 20 fathoms one mile to the northward; in this direction it shoals more gradually than from the other sides. The vicinity of this reef may be known by the bottom being composed of coarse gravel and stones within a radius of 2 miles; if the soundings exceed 35 fathoms a vessel is to the eastward of the reef.

Clearing marks.—The distance from the shore will render clearing marks available only in clear weather. Tua-motu peninsula, in Poverty bay, is shut in when to the northward of the reef; and when Tua-motu just opens like an island, a vessel will be half a mile north of it. At the reef, the top of the white Gable (cape Gable) is nearly on a level with the land behind it.

During three days that H.M.S. *Pandora* was surveying in the vicinity of these rocks, they could not be distinguished until close to their position, and though the wind during the greater part of that time blew fresh from the N.E., yet there was no break; but after a S.E. gale they were seen to break heavily from the shore.

MAHIA or TERA-KAKO PENINSULA, which is 12 miles long in a north and south direction, and 9 miles north-east and south-west in its widest part, forms the northern head of Hawke bay, and is 20 miles south of Young Nick's head. It is connected with the mainland by a sandy neck about 2 miles in length and three-quarters of a mile broad; a river flows through this neck and runs into the sea on the eastern side; this, when it is swollen, gives Mahia the appearance of an island. On the outside of this neck, which is W.N.W. 5½ miles from Table cape, there is anchorage with south-west winds a mile from the beach.*

Wangawai road.—On the north coast of the peninsula, 2½ miles westward of Table cape, there is a good roadstead off Wangawai river, affording shelter in south and west winds; the anchorage is in 10 fathoms mud, one mile north of the river, with Table cape bearing E. by S. ½ S.; it is safe during the ordinary sea breeze, but care must be taken to leave on the approach of easterly winds. The schooner *Governor Hobson*, in 1845, was swamped here, and all hands perished, by holding on too long. She was driven on to a patch of shifting sand—breaking in 5 fathoms—1½ miles N.W. of Wangawai, and about three-quarters of a mile off shore.

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* *See* Admiralty coast chart, sheet IV., Poverty bay to cape Palliser, No. 2,528; scale, $m = 0·25$ inches.

Small coasters can enter Wangawai, as it affords anchorage in 6 feet; thence to Table cape the ground is foul, and rocks awash extend from the shore north of the cape nearly one mile.

Table cape, the N.E. extreme of Mahia peninsula, is 21 miles S. by E. ⅝ E. from Young Nick's head; from it the east coast of the peninsula trends S. by W. ¾ W. 11½ miles to its extreme point, and is studded with off-lying dangers.

Dangers.—The first of these dangers is a reef 3 miles S.S.W. ½ W. of Table cape, extending three-quarters of a mile from the shore off Taiporutu.

Hawini rocks.—One mile farther south is Hawini, a detached reef 3½ miles long, its outer edge being 1½ miles from the shore; leaving a channel within, half a mile broad, sometimes taken by coasters in fine weather, but not recommended; the northern extremes of Hawini rocks dry 6 feet at low water, the rest are covered and only occasionally break.

Bull rock.—Three miles S.S.E. ½ E. of this ledge is Bull rock, which dries one foot at low water; this isolated danger is 3¾ miles E. by N. from the south point of Mahia peninsula, and 4¼ miles N.E. of the south extreme of Portland island; 20 fathoms will be found within one-third of a mile round it.

Another reef, which dries 2 feet at low water, exists midway between Bull rock and the extreme of Mahia; it appears to be a narrow ledge extending one cable north and south, and a channel within; its centre is 2 miles E. by N. ¾ N. from the south extreme of Mahia: both these rocks when covered, only break when there is a swell.

Breakers.—With a high south-easterly sea running, heavy breakers have been observed between Portland island lighthouse and Bull rock, distant about 2½ miles from the island.

PORTLAND ISLAND.—South of Mahia peninsula extreme one mile is Portland island (*Te-houra*), so named by Cook from its resemblance to the well-known headland in the English channel; it is nearly 2 miles long in a N. by W. and S. by E. direction, of moderate height, and has a flat summit with a few bushes on it. A channel, one-quarter of a mile wide with 6 fathoms, exists between the peninsula extreme and Portland island; this channel borrows on the Mahia shore, but the rocks extending off either coast show. If a vessel is caught in a southerly gale and cannot weather Portland island, this channel is available, but as it leads among the rocks before described, it cannot be recommended. The tide sets through with a force of 2 knots.

The south extreme of Portland island is foul half a mile from the shore.

LIGHT.—The lighthouse on Portland island is on its southern extremity; the tower, 28 feet high, is painted white, whence at an elevation of 300 feet above the sea is exhibited a *revolving* white light of the second order, attaining its greatest brilliancy every *thirty* seconds, which should be seen in clear weather from a distance of 24 miles.

From the lower part of the lighthouse, a fixed *red* light, visible through an arc of about 6 degrees, is shown in the direction of Bull rock, which bears N.E., 4 miles distant.

COAST NAVIGATION.—From the preceding remarks it will be noticed that the east coast of the North island from the East cape to Hawke bay, a distance of nearly 100 miles, has only two roadsteads for ships of burthen, viz., Poverty and Tolago bays; and although coasters do sometimes anchor in Open and Tokomarua bays, yet these can only be approached in fine weather, and do not deserve the name of anchorages; also that the coast has many dangers within a league of it, and that even in fine weather and with westerly winds there are few spots where cargo can be shipped by vessels anchoring cautiously off it.

There are indeed few places, if any, where even coasting vessels would be safe in a gale, for the rivers are only accessible in fine weather at the proper time of tide.

Soundings.—Besides carefully avoiding the Ariel rocks, and the off-lying dangers from the Mahia peninsula, a stranger should not approach the coast thus described nearer than a league; the position of a vessel can be well determined by the soundings, which will be found to decrease from about 40 fathoms, at 2 leagues off shore, to 24 fathoms at one league; the bottom being green mud outside 24 fathoms, and fine sand within that depth.

Tides.—Advantage can be taken by standing off or in shore according to the tide, which is felt to a distance of 15 miles from the coast; within 4 miles of the shore the springs run 2 knots and the neaps one knot an hour; near the projecting headlands they will be found more rapid, and either tide, striking against a point, has a tendency to set off it.

FROM MAHIA OR TERA-KAKO PENINSULA TO CAPE PALLISER.

The coast from Mahia peninsula to cape Palliser, a distance of 180 miles, is still more destitute of shelter than that just described; and with the exception of a few anchorages in Hawke bay, there may be said to be none along this whole extent of coast line.

HAWKE BAY is an extensive inlet, the distance from Mahia peninsula, its northern limit, to cape Kidnappers, its south extreme, being 41 miles in a north-east and south-west direction, the depth of the bay being 24 miles; it is entirely open to south-east winds. The principal anchorages are off Long point on the west side of Mahia peninsula, at Ahuriri, and at cape Kidnappers. Long point affords shelter during north-east and south-east gales, and cape Kidnappers in south-westerly.

Long Point roadstead, at the north-east extreme of Hawke bay, is sheltered from all winds but westerly. The holding ground is not always good, but by anchoring a mile N.N.E. from Long point, there is good protection from the black north-easter,* and ample room to weigh, taking care to avoid the shoal patch of 2¾ fathoms lying 3 cables off Moemoto head.† To ride out a south wind, it is requisite to get well and close inside Long point, until an opening or cleft shows itself; bring the point to bear S.W. and anchor in 7 fathoms blue clay, this is the best holding ground. The cliff within the point is steep-to, but vessels should be prepared to take an outer berth when the gale abates, and if a south-west wind sets in, to proceed to Wangawai road.‡

Water.—Long point affords an excellent supply of fresh water.

Anchorage for small vessels will also be found under Black reef point, which lies nearly midway between Long point and Portland island, and under Waikokopu, near the western shore of the sandy neck of the peninsula; but their partial shelter is only adapted to those coasters who are accustomed to take up the berth.

Wairoa and Mohaka rivers.—19 miles westward of Long point, on the north shore of Hawke bay, is the entrance to the river Wairoa, and 11 miles farther to the south-westward is the small river

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* It frequently blows from the north-west in Hawke bay, while it is north-east at Long point; the neck of low land causing the in-draught. The black north-easter is so called as distinguished from the summer sea breeze from the same quarter.

† *See* page 132, Dangers in Hawke bay.

‡ *See* plan of Long Point anchorage, on Admiralty chart, No. 2,531; scale, $m = 6$ inches.

Mohaka, but both entrances are difficult; the mouths also shift, and a south swell detains vessels inside with the chance of being blocked up.[*]

A printed report by Sir John Coode, C.E., 1881, states that "the Wairoa river on the average of late years, has been open only to steamers of about 4 or 5 feet draught for about 9 months in the year."

Wairoa.—"The depth on the bar of the Wairoa varies from 4 to 8 feet, it is always shifting. Vessels drawing 7 feet may enter with smooth water, but in all cases strangers should wait for a pilot. Several small steamers trade between this place and Napier.

Mohaka river can be entered by vessels drawing not over 4 feet water. Great care should be taken in landing, as there is a bar at its mouth, also a heavy surf on the beach, unless after a continuance of strong land breezes. A small steamer runs regularly to Mohaka."[†]

Tides.—It is high water, full and change, at Wairoa river at 6h. 45m.; springs rise 7 feet, and neaps 4 feet.

The anchorages off these rivers are available in fine weather, but a heavy ground swell sets into the bight of the bay. On the approach of a south wind it has appeared ready to break in 12 fathoms.

At 11 miles south-westward of Mohaka, and under the highest bluff, is the small boat harbour of Waipapa, and 7 miles farther, the small headland Whakaari, which affords partial shelter for small coasters. Whakaari forms the north extreme of a sandy bay, 9 miles in extent in a southerly trend, terminating at Ahuriri, port Napier.

AHURIRI or PORT NAPIER.—This port is the only harbour deserving the name between Tauranga and port Nicholson, and is adapted to vessels drawing 10 or 11 feet water; the entrance is narrow, but inside it expands into a large sheet of water.[‡]

Ahuriri bluff, 1¼ miles eastward of the Port entrance, is conspicuous from seaward, being composed of bold white cliffs. It is the N.E. extreme of a group of hills closely conjoined, which rising out of the low land has the appearance of an island. On the flats at its base westward, is the city of Napier.

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[*] We found the Wairoa, a considerable river, had changed its mouth within the last three years, having shifted 1½ miles to the eastward. The entrance is very difficult, but within it has a depth of 12 to 14 feet, and navigable for boats 12 miles.—Commander Drury, in New Zealand Government Gazette, July 5, 1855.

The entrance of the river is narrow, and has a considerable bar; the tides run 6 or 7 knots, there is consequently great difficulty in entering with boats. It is a fine river inside, and there seems to be a fair amount of good land where the settlement (Clyde township) is being formed.—Remarks: Commander Freemantle, H.M.S. *Eclipse*, 1866.

[†] Napier Almanac.

[‡] *See* Admiralty chart, Ahuriri road and port Napier, No. 2,513; scale, $m = 10{\cdot}0$ in.

Ahuriri roads.—The best anchorage is in 6 fathoms good holding ground, near the mooring buoys, about one mile off the harbour entrance, with the Bluff just described, bearing S.E. by E., cape Kidnappers being shut in. These roads are safe in south, south-west, and north-west winds, and during the ordinary summer north-east sea breezes ; the black north-easters give ample warning of approach.

Commander Sullivan, H.M.S. *Harrier*, remarks: "We found the anchorage anything but safe with southerly or south-west winds, a tremendous swell setting into the bay, caused the ship to roll 33°. On the 23rd April, best bower cable parted abaft the bitts; force of wind at the time, 4, S.S.W."

LIGHTS.—A *fixed* white light, 160 feet above the level of the sea, is shown from a white tower, 20 feet high, on the eastern side of Ahuriri bluff, nearly half a mile south of the extreme point, and should be seen in clear weather from a distance of 18 miles.

On the eastern pier at entrance of port Napier is also exhibited from a lighthouse, painted black, situated 190 feet within its outer extremity, a *fixed* light 27 feet above the sea, and visible in clear weather from a distance of about 7 miles. The light shows white when bearing from S.W. ½ W. to S.W. ½ S.; *red* from S.W. ½ S. to S.S.W. ¾ W. over Pania rock; white from S.S.W. ¾ W. to S. ¾ E.; *green* from S. ¾ E. to S.S.E. ½ E. over the anchorage ; and white westward of the anchorage.

Note.—Vessels approaching port Napier at night from the southward, should have the white sector of this light well open before rounding Ahuriri bluff, in order to avoid Auckland rock.

Caution.—Vessels must be careful not to mistake the white sector of the light at the entrance of port Napier for the light on the Bluff.

Pania rock.—In approaching Ahuriri roads care must be taken to avoid the Pania rock, a danger with only 7 feet on it, bearing N. by E. ½ E. from the bold white cliff of the Bluff, 2½ miles distant; northward of this reef the bottom is uneven.

Buoy.—A white conical buoy lies in 9 fathoms water at about a cable S. by W. from the Pania reef, with the Bluff bearing S.S.W. nearly, distant 2 miles.

Auckland rock.—The depth on the rock at low water is 18 feet; from it the Bluff bears S. by E. about 4½ cables, and the west point of the Bluff S.W. ¾ S.

Sunken rock.—A rock with 9 feet water lies with the Bluff extreme bearing West, and cape Kidnappers S.E.

Mooring buoys.—There are two mooring buoys in 6 and 7 fathoms water, in the south-west part of the roads W.N.W. from the Bluff, and about a mile from the shore. The moorings are placed in the best holding ground, and are sufficiently strong for a vessel of 1,000 tons. They are used by ships loading wool, which is conveyed from the harbour by small steamers, &c.

Water.—The only fresh water available for ships within 3 miles of the entrance to port Napier, is from a tank which holds about 16 tons of rain water. The surf on the bar renders watering a precarious operation.

The following remarks on port Napier are by Commander Drury:—

"We arrived in Hawke bay, anchoring W. by N. 1½ miles from the Bluff; we remained at the roadstead off Ahuriri ten days, and at one time I was in great hopes of getting into the harbour, having found it deeper than usually reported, there being a depth of 12½ feet at high water, at the shoalest part. The tides are rapid, but by leaving the roadstead at or near slack high water there is little difficulty in entering."

"We found considerable change in the entrance to Ahuriri since March last, but not less water; the Rangatira bank is now connected with a low spit extending from the south shore, about one-third of a mile north of the mouth."

"**Entering port Napier.**—The present leading marks may not always be correct; it is said the Rangatira bank is affected by the freshets. On entering or leaving the harbour, it must be remarked that the flood sets across the entrance to the eastward; therefore, on passing the point, steer for Meanee point, and the deepest anchorage is immediately inside it. On leaving the harbour it must be remembered the ebb sets to the westward, directly towards the Rangatira bank. The flood stream runs in nearly two hours after high water to cover the extensive flats. The strength of the tide at the entrance is 6 to 7 knots. The proper time to approach is when it is high water by the beach; there will then be sufficient stream to enter. Vessels drawing 6 to 7 feet water should anchor off M'Kain's hotel, as there is less tide there."

Tide.—It is high water, full and change, at port Napier at 7h. 50m.; rise and fall, 3 feet.

The town of Napier and buildings round the port are rapidly advancing, and the communication with the settlements of the interior being so simple, both by land and water, this fertile district will become of great importance, and the exports must soon be considerable. The population of Napier in 1878 was 8,376.

The inland navigation near Ahuriri is a great natural acquisition to this province, besides the Ahuriri.

Brett's New Zealand Pilot, 1880, contains the following information:—
"Napier the capital and principal shipping port of the provincial district

of Hawke bay is, like most other New Zealand port towns, rapidly increasing in size and importance. The harbour is confined, and only adapted to vessels drawing 10 or 11 feet of water. The works recently constructed are, a pier or breastwork from the bluff point within the harbour on the south-eastern side to within a short distance of the eastern spit point, inside which, on the flat now reclaimed, is the railway terminus site. Along the outer end of this pier vessels lie, grounding on the mud at low water. Between the end of this pier and the inner part of the eastern spit, there is still a narrow channel in, used by the small local steamers and coasters going to and from the wharves which lie inside.

"From both the entrance spit points, breastworks have been carried out seaward to near the bar, for quite 2 cables and a full half cable apart; the western one ends a little south-eastward of Rangatira bank. The bar, which is about a cable beyond the ends of these breastworks, usually shifts with every gale; and on these occasions is invariably re-sounded by the harbour-master, before attempting to take vessels over it. These works, as pointed out by the harbour-master, have necessarily the effect of scouring and deepening the channel."

Aspect.—The aspect of the country in Hawke bay is mountainous on the north, with fine valleys at Wairoa, Mohaka, and Whakaari, and these are the timbered districts. South of Whakaari will be found impassable white cliffs, backed with undulating downs of curious formation, from the extreme regularity of the rises and hollows.

Winds and Climate.—Hawke bay has a fine climate; but the winds are very uncertain, and the sudden south-easters make it necessary to be cautious when trading off Wairoa and Mohaka:—the southers give more warning, by an overcast sky, but they are violent, especially in the winter. The westerly winds occur chiefly in October and November, blowing very strong with a low barometer, but generally fine weather. The black north-easter may be expected about once a month; this gale comes on very gradually, but latterly blows very hard, accompanied by rain, veering to north-west and south-west.

The ordinary summer wind is a fine north-easter, with hazy weather, setting in at 10 a.m., and dying away at sunset, and succeeded by a land-wind. The barometer rises to north-east, south-east, and south winds, and falls to north, north-west, and westerly winds. Rain may be expected with north winds and the black north-easters, and often with south-east winds; sometimes dry south-easters last for many days.

Tides.—High water full and change, at Long point, 6h. 0m. Springs rise, 5 feet; neaps, 4 feet. The tides in Hawke bay are slack, but strong in the river mouths. The flood sets in from the south, ebb from the north.

AHURIRI to CAPE KIDNAPPERS.—From Ahuriri bluff a sandy beach extends 10 miles to the southward; the rivers Nga-ra-ruro and Tuki-tuki disembogue respectively 5 and 8 miles from the Bluff; the former running from the eastward intersects the province, and is navigable many miles into the interior; the Tuki-tuki has a changing bar but is navigable 12 miles for boats.

CAPE KIDNAPPERS projects 4½ miles to the eastward; it is a high point with white cliffs (argillaceous clay) on either side of it, and two remarkable white rocks off the extreme. Cape Kidnappers anchorage is the shelter afforded by a reef extending from a point one mile westward of the cape; here a vessel can ride out south-east and south winds—the anchorage has otherwise little to recommend it; the landing is bad, and no water or stock can be procured. Vessels should be ready to weigh when the wind changes to the eastward of south, as a heavy swell then sets in.

Dangers.—The Government of New Zealand has given Notice, April 1881, of the reported existence of a sunken danger (*Mercia shoal*), on which the barque of that name is stated to have touched lightly, with cape Kidnappers bearing W. by N. ¾ N. distant about one mile—the lead just before the vessel touched gave 7 fathoms water.

Another sunken danger (rock), on which the steamer *Lord Ashley* is reported to have struck, lies with cape Kidnappers bearing S.E. by S. distant one mile, and half a mile from Black reef.

The positions of these dangers must be regarded as approximate only; vessels are recommended therefore not to approach cape Kidnappers within 2 miles.

Dangers in Hawke bay.—So far as Hawke bay has been examined, there is deep water all over it; there are from 40 to 70 fathoms across the entrance, a general depth of 20 to 30 inside, and 7 to 12 fathoms 1½ miles from the shore. The following dangers are alone known to exist;—a shoal patch of 2¾ fathoms N.N.E. ½ E., 1½ miles from Long point, and 3 cables S.W. ½ W. from Moemoto head; the Pania rock, and the 9-feet rock off Ahuriri bluff, already noticed. The ground off Mohaka river is also foul.

CAPE KIDNAPPERS to CAPE TURNAGAIN.—From cape Kidnappers to cape Turnagain, a distance of 56 miles, the trend of the coast is S. ¾ W., offering no remarkable or striking feature;

a sandy beach extends nearly 11 miles from the point, and the small island Motu-kura (or Bare island) 1¼ miles from the coast is 13 miles from it; the Capstan rock, above water, lies three-quarters of a mile S.W. of Bare island.

Southward of Bare island the coast is rocky, with some detached patches lying nearly a mile off shore; 9 miles distant from it is the Manawarakau river and Pah, with a sheep station near; a reef above water lies immediately off the mouth of this river, extending north and south for one mile. 8 miles south of Manawarakau is Tungara cove, where there is anchorage for coasters, but considered dangerous, and seldom resorted to; a reef extends off each point of this cove, and it is rocky within.

Black head (a cliffy point) is 7 miles southward of Tungara cove. "It affords shelter during northerly and all off-shore winds under the reef extending south-east from it. In fine weather handy vessels may anchor in 4 fathoms, with the extreme of Black head N.N.E. one mile, just open of a flat-top rock near the landing-place."*

Oputu or Shoal bay, a slight indentation of the coast, is nearly midway between, on either side of which, towards the Cove and to Black head, fringing rocks extend half a mile from the shore. Immediately southward of Black head is a small islet half a mile off shore.

Parangahau river, 4 miles from this islet, lies in the depth of a sandy bight extending 8 miles S.S.W. of Black head, and 10 miles beyond, to the southward, is Te-poroporo, or cape Turnagain of Cook.

CAPE TURNAGAIN is a well-marked cliffy projection, making as a white bluff from the northward, and as table-land from the southward; another hill, the chalk Nipple, so called from its white appearance, rises immediately over the coast 3 miles to the northward of the cape; there is a mile of beach close to the north of the cape, where boats may land in moderate weather.

From cape Turnagain the direction of the coast is S.S.W. for 30 miles to Castle point; the shore is frequently faced with rocks; the hills slope gradually; there are small wooded valleys, but the country generally is hilly, (from 500 to 1,200 feet,) apparently covered with natural grass. No dangers are known to exist more than 1½ miles from the coast, but the observation, that no stranger should approach the land to the northward of Hawke bay within a league, is equally applicable to the coast between it and cape Palliser.

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* Wellington Almanac.

Soundings in 30 fathoms mud were obtained 3 miles from the shore, and 60 fathoms at 6 miles, except off cape Turnagain at which distance the soundings are 100 fathoms, sand bottom.

CASTLE POINT is a rock nearly detached from the shore, and from the north it presents the appearance of a square tower at the extreme of a low point; and there is a sandy bay 2 miles long to the northward of it "affording anchorage with winds from N.N.W., through west, to S.S.W. in 2½ to 3 fathoms water, about 2 cables from the extreme of the point in line with the northernmost house in the village. Vessels should be ready to weigh if the wind veers east of south."*

Soundings.—At 8 miles from the shore there is a depth of 60 to 70 fathoms.

FLAT POINT.—24 miles S. by W. ¼ W. of Castle point is Flat point, a low projection with a sandy tongue running a short distance out, and a rocky ledge extending one mile from it to the northward.

Dangers.—Flat point and the coast for the distance of 12 miles south-west of it, is fronted with outlying sunken rocks, extending in places 1½ miles from the shore. H.M.S. *Eclipse* in December 1864, found one awash at 1½ miles E. by S. ½ S. from Flat point; also a reef, 2¼ miles from this rock, running in a north-east and south-west direction nearly 2½ miles, Flat point bearing from it S.W. ½ S. 2 miles.

Kahau rocks, a small cluster above water, lie fully one mile off shore, with a depth of 49 fathoms 1½ miles to seaward; they are distant 9 miles from Flat point, and 29 miles from cape Palliser.

A shoal, on which the steam-ship *Rangatira* grazed, is supposed to lie E.N.E. 2 miles from Kahau rocks. The weather at the time being thick, the exact position of the danger could not be ascertained. Other dangers, the positions of which are unknown, are said to exist in the same locality.

The coast from Flat point to cape Palliser trends S.W. ½ S. nearly 38 miles; the coast line is itself low, formed of sand and shingle beaches with rocky points, and ledges extending in places one mile off shore; the depth of water being 48 and 50 fathoms, 2½ miles from the land. The ranges of hills, which generally run parallel with the coast a short distance inland, are moderately high (the seaboard presenting a succession of level table steppes), and increase in elevation as cape Palliser is approached, where a high steep and sterile mountain range within 2 miles of the extreme of the cape, attains an elevation of 2,850 feet.

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* Wellington Almanac.

CAPE PALLISER is the south extreme of the North island of New Zealand, and the south-east entrance point to Cook strait; it forms a remarkable bold-looking promontory from a distance, but as it is approached, two low shelving points will be seen to extend from it to the southward. A reef, partly above water and awash, extends half a mile from the eastern of these two points, and the Black rocks, 15 feet above water, extend one mile from the western; strong tide ripplings also extend 1½ miles from the cape, and vessels should not round it within 2 miles, even in fine weather; at this distance will be found 35 fathoms, sand and shells, the 100-fathom line being 3 miles off shore.

CHAPTER IV.

COOK STRAIT.

VARIATION IN 1883.

Port Nicholson, 15° 00′ E. | New Plymouth, 14° 20′ E.

CAPE PALLISER TO NEW PLYMOUTH (TARANAKI).

The navigation of Cook Strait,—separating the two principal islands of New Zealand,— and which is daily increasing in importance, was up to a late period considered very formidable to the mariner, and perhaps not unjustly so. The accounts of the early navigators, the strong winds, and at times furious gales which the locality, and the configuration of its shores, render it liable to, the rapid tides and races, and above all the want of an authenticated survey, tended to confirm the impression, and to magnify the dangers which do exist, as well as to add many imaginary ones.

There are however in reality but few actual dangers; the southern shore abounds in secure harbours, easy of access either in north-west or south-east gales, which are the prevailing and indeed the only winds that blow with any violence; with the present charts, and by observing proper caution and vigilance, Cook strait may be navigated with confidence. It is the high road of the fleet of intercolonial steamers and coasters, and for ships from the westward bound to Wellington and Nelson, or to the new settlements, on the east coast of the Middle island; and homeward-bound vessels from Australia, also occasionally pass through it, as they generally calculate on a north-west wind, preferring this direct route to that of making the passage either northward of the Three Kings islands, or to the southward of Stewart island.

Having in the last chapter conducted the seaman along the eastern coast of the North island, the description of Cook strait from its south extreme will be here commenced, taking in the first place its northern outline, with the harbour of port Nicholson, on whose shore stands the town of Wellington, the capital and seat of Government.*

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* *See* Admiralty coast chart, sheet V., No. 2,054; scale, $m = 0{\cdot}25$ inches; and Cook strait, No. 695; scale, $m = 0{\cdot}5$ inches.

From a position 2 miles distant, and abreast the Black rocks off cape Palliser, a W.N.W. course for 24 miles will take a vessel to the entrance of port Nicholson, passing Taourakira and Baring heads at the same distance. The outer rock of Barret reef will then bear N. by E. 3½ miles, and the entrance of the port will be open.

PALLISER BAY.—Palliser or Useless bay is a deep indentation of the coast between cape Palliser and Taourakira head; its distance across is nearly 18 miles, and its depth 8 miles.

Caution.—This bay is perfectly open to southerly and south-east winds, and vessels should be very careful not to get embayed, as sudden shifts of wind to these quarters are not uncommon when it would be a dead lee shore, with no shelter; there are from 10 to 14 fathoms within 2 miles of the beach, but the holding ground is bad, and a heavy sea soon gets up.

From the head of Palliser bay the fine valley of the Wairarapa extends in a north-easterly direction; it contains about 350,000 acres of level grazing land, and is connected with other grassy plains extending to Hawke bay on the eastern, and the head of the Manawatu river on the south-western side of the North island. The Ruamahunga river, after traversing this valley, loses itself in two extensive but shallow lakes, whose accumulated waters during the winter months force a passage through the narrow sand bar which separates them from Palliser bay; these lakes extend 15 miles in a north-easterly direction from the head of the bay, and are navigable for boats, that may afterwards ascend the Ruamahunga 20 or 30 miles; numerous settlers are established in the Wairarapa valley.

TAOURAKIRA HEAD is a bold headland, with the Rimutaka mountains extending from it in a north-easterly direction along the west side of Palliser bay; of this mountain range, the Hump, 3,425 feet high, is 3 miles from Taourakira head; and mount Francis, 3,770 feet, lies over the north-west angle of the bay.

The outline of the land at the back of Taourakira head is more regular than that of cape Palliser, and, approaching from the eastward, it appears from a distance to end in a bold abrupt convexity. On a nearer approach, a low point will be observed extending from its base, which gives it much the appearance of the snout of a porpoise; low detached straggling rocks extend off Taourakira head one-third of a mile, and continue almost the same distance from the coast as far as Baring head;—the Orong-orong river flows into the sea between these two heads.

BARING HEAD is nearly 3 miles W.N.W from Taourakira head, and is a flat table point, at the extremity of terrace land, extending towards

Pencarrow head;—detached rocks above and below water extend from it about one-third of a mile.

Rocky ground having depths of 4½ to 7 fathoms lies N.W. ¾ W. 2½ cables from Baring head. The ledge lies parallel to the coast, and is 3 cables long by one cable broad; the sea breaks on it in bad weather.

Pencarrow head N. by W. leads westward of the reef, and of other detached rocks off Baring head. Taourakira head open of Baring head E. ½ S. leads southward of these dangers.

Arabella rock.—A sunken danger on which the barque *Arabella*, drawing 15 feet, struck, when getting under-way, is stated to be a pinnacle rock with a depth of 7 fathoms near it. The master of the vessel was not able to ascertain the exact position of the rock, but has given the following bearings and distance, as a near indication:—Pencarrow head lighthouse N.N.W., and Baring head E.S.E., distant about one mile.

Vessels passing or rounding Baring head, should give it a wide berth.

FITZROY BAY and Anchorage.—Between Baring and Pencarrow heads is Fitzroy bay, a slight indentation of the coast only, where vessels waiting to enter port Nicholson sometimes ride out a north-west gale, by standing sufficiently near the shore to shut the entrance in by Pencarrow head, but keeping the southern part of Barret reef just open of the rocks off that head; this gives a berth half a mile from the beach in 10 to 12 fathoms.

The harbour-master at Wellington notices that, "the best anchorage at the heads is one mile south of Barret reef, keeping the reef in a line. Fitzroy bay has a foul bottom, and as the wind chops round to S.S.W. and South, it places vessels there on a lee shore. At night anchor as near as possible on the line dividing the *red* and white sections of Somes island light, and Pencarrow light N.E. by E. in 12 fathoms."

PORT NICHOLSON.

PENCARROW HEAD.—Pencarrow head, N.W. by N., 3 miles from Baring head, is the eastern entrance point of port Nicholson, it is a bold cliff, with a lighthouse on its summit. Low straggling rocks, above water, extend off this head nearly 2 cables.*

LIGHT.—The light on Pencarrow head is a *fixed* white light of the second order, placed at an elevation of 420 feet above high water, and in ordinary weather should be visible at a distance of 30 miles. From the lighthouse, Baring head bears S.E. by S. (southerly) 3 miles, and Sinclair head W. by S. ½ S. 6 miles.*

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* *See* Admiralty plan, port Nicholson, No. 1,423; scale, $m = 3 \cdot 0$ inches.

The western side of entrance to port Nicholson is formed by a high peninsula almost separated from the mainland, by Evans bay on the harbour side and Lyall bay to seaward, the low sandy neck separating these bays being scarcely half a mile across.

Approaching port Nicholson from the southward or eastward, this peninsula from a distance appears like an island, and in consequence Lyall bay has frequently been mistaken by strangers for the true entrance.

PALMER HEAD, the south-eastern extreme of the peninsula just described, is the western entrance point of the port; the land over it is moderately high, and it bears from Pencarrow head W.N.W. 1½ miles, with a reef of rocks called the West ledge extending off it to the southward nearly three-quarters of a mile; these rocks are all above water, or awash, and may be approached with perfect safety within a quarter of a mile carrying 10 and 12 fathoms.

Pilot.—The pilot station is in a cove immediately westward of this head, also another within the entrance; pilots only board ships outside in moderate weather, on their hoisting the pilot signal. (For the New Zealand general harbour signals, see page 15.)

Between Palmer head and Waddel point, the next projection, distant one mile N.E. by N., is a Signal station on an elevation of the land.

Barret reef, which constitutes the chief impediment to the entrance of the harbour, is a cluster of rocks principally standing well out of water, lying nearly in the centre of the passage, and extending a little more than half a mile in a N. by W. and S. by E. direction, with an average width of about a cable. There are 7 fathoms within half a cable of these rocks, and no off-lying dangers; their southern extreme, Outer rock, is a black rock 10 feet out of water, which may be rounded within a cable in 9 fathoms: there are two sunken rocks of 12 feet water, deep all round, one lying about 100 feet to the eastward and the other about the same distance westward of the Outer rock; from this rock Pencarrow light bears S.E. by E. ½ E. nearly one mile.

Chaffers passage, to the westward of Barret reef, is 3 cables wide, with a depth of from 7 to 10 fathoms, but being tortuous in its direction, is only used by small vessels with a leading wind.†

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* Pencarrow lighthouse opens on an E. by N. ½ N. bearing coming from the northwestward, and N.W. ¾ N. coming from the eastward.—Remarks by Mr. E. W. Creak, Master H.M.S. *Esk*, 1865.

† Chaffers passage is not used even by steam coasters, as several sunken rocks are said to exist in it, the positions of which are not known.—Remarks by Nav. Lieut. J. E. Petley, H.M.S. *Dido*, 1872.

The Main channel, or that between Pencarrow head and Barret reef, is the broadest and usual passage, with a clear breadth of not less than 6 cables for a distance of 1¼ miles; that is, from the southern end of Barret reef to abreast Steeple rock, which lies on the west shore off the northern extremity of Waddel point.

Caution.—All the points of the coast on the eastern side of the entrance, have straggling rocks awash extending a cable off them ; vessels working in should be cautious in approaching close to this shore, as in the event of missing stays they are in great danger from these out-lying rocks, and liable to get into eddy tides; the British merchant ship *Inconstant*, of 600 tons, struck in this way, and but for the timely assistance of H.M. surveying steam-vessel *Acheron*, would have gone to pieces.

Waddel point (*Dorset point*).—From this point a reef, similar in feature to Barret reef, extends to the south-east nearly 3 cables ; and from the northern end of the point another reef, of which the remarkable Steeple rock is the extreme, extends to the north-east for 2 cables. Off Steeple rock a cable, in a north-easterly direction, is a rock with 9 feet on it at low water; the distance between the extremes of these two reefs is nearly three-quarters of a mile, and vessels working up may stand on until in a line between them, having then 21 feet at low water.

Young bay (*Worser bay*) is on the western shore, half a mile above Steeple rock, where a vessel may anchor if necessary in 5 fathoms, a quarter of a mile from the beach.

After passing Steeple rock there is a clear working channel of more than a mile, with from 6 to 12 fathoms between the western shore and Ward island; the points on the western shore may be approached within a cable.

Ward island, a small yellow-coloured cliffy island, lying on the eastern side of the channel, 2½ miles above Waddel point, and 1½ miles from the western shore, has shoal water extending from it to the south-westward nearly half a mile, narrowing the passage between the shoal water and the western shore at Gordon point, off which rocks extend one cable, to about a mile. To avoid this danger, known as Hope shoal, vessels with a leading wind after passing Steeple rock and its outlying danger, should keep the western shore on board within half a mile; by steering for the western extreme of Somes island, or keeping that island a little on the starboard bow, it will also be well cleared. This part of the channel is reported to have shoaled to 5½ and 6 fathoms.

Hope Shoal and buoy.—In working in, the western side of Ward island should not be approached within a long half mile ; at nearly that distance the water shoals suddenly from 8 fathoms to 16 feet, and in one spot to 10 feet; when the north end of the island bears East, the shoal is passed, and the shore is then bold. A small red buoy in 16 feet water marks the western edge of this shoal.

There is a passage between Ward island and the eastern shore which is available for small vessels, the least depth of water being 12 feet.

Halswell point is the north extreme of the peninsula on the western shore, and is 2¾ miles northward of Waddel point; rocks extend a cable off it, which are marked by a small red buoy in 5½ fathoms. On rounding it, the town of Wellington will be opened out; Pipitea, a low sandy point, (the north-west limit of Lambton harbour,) bearing West 2 miles.

Evans bay is immediately round Halswell point running nearly 2½ miles to the southward. Jerningham point (its western point, as also the east entrance point of Lambton harbour), has a rocky patch of 16 feet lying a cable from it, with a 9-feet patch between, in a N.N.W. direction, and is marked by a small red buoy in 5½ fathoms. Evans bay has an average breadth of more than half a mile, with no dangers, and deep water all over; 20 feet at low water will be obtained 3 cables from the sand beach at its head.

Vessels occasionally come here to repair, preferring it to Lambton harbour for that purpose, as it is equally if not better sheltered from north-west and south-east winds, from being more confined; with north-east winds, which are unusual, a swell sets in.

A patent slip has been constructed in Evans bay, capable of taking a ship of 2,000 tons; it is 1,050 feet long, with a cradle which can be lengthened to 276 feet: there is a depth of 31 feet at high water at the end of it. Buoys are laid down for swinging ships in this bay.

LAMBTON HARBOUR.—After passing Halswell point, a vessel may steer W. by S., for the Government house flagstaff (about 2 miles distant), anchoring in the harbour as convenient; 4 and 5 fathoms, mud or sand will be found a quarter of a mile from its shores, and outside that distance from 6 to 9 fathoms. A good berth is with the Government flagstaff bearing about N.W., and the Waterloo inn,—a large white building on the extreme of Kai-warra point,—just over the low sandy point of Pipitea (Kai-warra is one mile north of Pipitea), a vessel will then be in 4 fathoms, mud, a quarter of a mile off shore; inside this line the water shoals rather suddenly.*

Pipitea point must not be approached within a quarter of a mile, as a sand and shingle shoal with 6 feet water extends from it 1½ cables;

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* *See* plan of Lambton harbour on Admiralty chart, No. 1,423; scale m = 5·5 inches.

there is a watering place at this point, as also another at the head of the harbour from small streams.

The land between Pipitea point and Government house has been reclaimed, and it is intended to fill in the shore within a depth of three-quarters of a fathom, as far as the Custom-house quay; there is a depth of between 5 and 6 feet at low water, alongside the part already completed.

The Government offices erected on reclaimed land just south of Government house form a large white conspicuous building.

Pier.—A large pier, Queen's wharf, has been built off the custom-house having deep water at the outer berths (23 and 27 feet), and warehouses with presses for wool and flax.

Lights.—Three triangular *red* lights are shown from the end of the pier.

Railway pier.—On the north-west side of Lambton harbour a railway pier has been constructed, extending in a S.S.E. direction; from the south extreme of this pier the north extreme of the outer part of Queen's wharf bears S. 16° W., distant $1\frac{4}{10}$ cables.

There is a depth of 4½ fathoms close southward of the pier head.

Lights.—From the outer extremity of this pier two fixed *green* lights are exhibited, placed horizontally 6 feet apart, at an elevation of 28 feet above high water, visible in any part of the harbour from the north side of Queen's wharf, through west, to Nhauranga (Ngahauranga).

Buoys.—The following six iron warping buoys, painted red, have been laid down in Lambton harbour:—

A buoy in 18 feet water at $1\frac{9}{10}$ cables S. 60° E. from the observation spot on Pipitea point.

A buoy in 22 feet water at $2\frac{8}{10}$ cables S. 25° E. from the observation spot on Pipitea point.

Four buoys lie off Queen's wharf; of these, two are situated on the following bearings and distances from the north extreme of the outer part of that wharf:—N. 45° E. distant $1\frac{6}{10}$ cables, and N. 66° E. distant 2½ cables. The other two are situated on the following bearings and distances from the south extreme of the outer part of Queen's wharf:—S. 35° E. distant one cable, and S. 54° E. distant $1\frac{6}{10}$ cables.

Water.—The jetty abreast of Government house has been considerably lengthened, and water may be obtained from a pipe led under it.

Time ball.—A time ball painted red and white is dropped from a staff at the custom-house at the instant of mean noon corresponding to longitude 172° 30′ E., the approximate mean longitude of the New Zealand islands, which meridian, determined on the assumption that Wellington observatory is situated in longitude 174° 48′ 50″ E., has been adopted to ensure uniformity of time throughout the colony.

Population.—In 1878 the population of Wellington city, the capital and seat of Government, amounted to 18,953.

Hutt river.—This river, after flowing through the pretty and fertile valley of the same name, runs into the head of port Nicholson, through the eastern extreme of a sandy beach 2 miles in extent; its embouchure is 6 miles from the anchorage at Lambton harbour, and 2 miles N.E. from Somes island; it is navigable for nearly 2 miles, or as high as the bridge for large cargo boats. The sandy beach may be approached within 3 cables in 4 fathoms; within this depth the soundings are irregular.

The extensive sheet of water in the northern part of port Nicholson, and of which Lambton harbour forms but a small portion, is free from dangers, with an average depth of from 10 to 15 fathoms.

SOMES ISLAND, lying about the centre of the port, is a cliffy island 250 feet high, about half a mile in length north and south, and a quarter of a mile in width; detached rocks extend off the north end a quarter of a mile; otherwise, by avoiding Somes rock, it may be approached within a cable carrying 7 fathoms.

Somes rock with only 14 feet on it at low-water, and from 10 to 15 fathoms all round, lies about 2 cables from the south-west point of Somes island; the centre of the patch bears from the lighthouse, W. by S. ¾ S.; and from the northern detached rock, above water, off the north end of the island, S. by W. ¾ W.

LIGHT.—On the south side of Somes island, near the middle, is a white octagonal iron lighthouse, from which, at an elevation of 75 feet above the level of high water, is exhibited a *fixed* light, showing white in mid-channel, *red* on the western, and *green* on the eastern shore of the main entry to the port. The light is intended as a leading light for vessels entering the port by the main channel entrance, and in clear weather should be seen a distance of 10 miles, or 4 miles outside Pencarrow head light.

From the lighthouse the centre of Ward island bears S.S.E. ¼ E.; Pencarrow head light, S. ⅞ E.; Steeple rock, South; Halswell point, S.W. by S.; and Jerningham point, S.W.

Caution.—Vessels entering port Nicholson at night, having arrived off Pencarrow head, and opened out the light on Somes island, must be careful not to change the white light on that island for *red* or *green* after bringing Pencarrow light to bear E.N.E.; until the triangular *red* lights on Queen's wharf bear W.S.W., when a course may be steered to any part of the anchorage.

When beating in, it must be remembered that the intersection of the white and *green* lights on Somes island, cuts very fine on Pencarrow head.

Soundings.—The soundings in port Nicholson have altered considerably since the last survey was made, but not sufficiently to interfere with the general navigation of the harbour; the bank extending from the shore in front of the town of Wellington has risen proportionably, therefore some allowance should be made by vessels desiring an in-shore berth.

Tides.—It is high water, full and change, in Lambton harbour, port Nicholson at 4h. 30m., rise of tide from 2½ to 5 feet; the strength of tide in the narrows at the entrance of the port, is from half a knot to 2 knots, but within it is much less. The tides are very much influenced by the winds, and after much rain a considerable fresh from the Hutt river sets out of the harbour.

The flood stream outside the entrance sets to the northward, and the ebb to the southward, and runs six hours each way.

It is high water by the shore at the southern entrance of Cook strait at 6h. 0m.; but the flood or northerly stream commences at 3h. 0m. or three hours before, and runs until three hours after high water by the shore.

GALES IN COOK STRAIT.—Strong gales are so frequent in Cook strait, and changes of wind from north-west to south-east, and the contrary, are often so sudden that it seems desirable to offer a few remarks as to the most prudent course to be pursued by vessels, under such circumstances, both in entering port Nicholson and in passing through the Strait.

Vessels arriving off the entrance of port Nicholson with a moderate north-west wind may work in by day or night, provided the weather is sufficiently clear to see the dangers, which are all above water, excepting the 9-feet rock, lying a cable north-east of Steeple rock; but should the weather be thick, or the light on Somes island not clearly distinguished, they ought not to attempt to enter at night, but stand off and on for daylight, or anchor according to circumstances, either outside Barret reef with the main entrance open, ready in case of a shift of wind; or in Fitzroy bay. (*See* page 138.)

It frequently happens, however, that a strong north-west wind is met at the entrance, when most well-found vessels, with daylight, may work in against a double reef topsail breeze, but with a stronger wind few vessels would be able to work through the narrows; it then becomes a question whether to stand off under easy sail, or to anchor outside. If a vessel can fetch in above Pencarrow head, she might anchor with advantage in 10 or 11 fathoms and ride out the gale, but the entrance should be kept open, as sudden shifts from north-west to south-east often occur, and vessels have found themselves awkwardly placed under such circumstances; that is, by anchoring under the lee of Barret reef, with a north-west wind.

Better shelter for the time is doubtless obtained by anchoring in 9 or 10 fathoms between this reef and the West ledge extending off Palmer head, but this anchorage is not recommended; if adopted, a vessel must be prepared to weigh immediately the north-west wind lulls, or she will be inevitably endangered by the one reef or the other, in the event of a shift to south-east.

Fitzroy bay must also be considered an eligible anchorage with a strong north-west gale, so long as it is not entered too far; for it has this advantage, that a vessel will be out of the tide, and in the event of a shift of wind to south-east the harbour can be run for.

With a south-east wind however strong, and clear weather, the port may be entered with perfect safety; if after nightfall (supposing the entrance to be well made out), the white light on Somes island will lead up the harbour, and when abreast of Halswell point, the *red* lights on Queen's wharf will open out, and W.S.W. will lead to the anchorage in Lambton harbour; under such circumstances a vessel should run in under easy sail and anchor immediately 6 fathoms is obtained.

A vessel leaving port Nicholson, bound to the northward, or to any of the ports on the eastern side of the North island, and meeting a south-east gale before she is clear of Cook strait, had better bear up and run to the north-west, making the passage round the north end of the island. Vessels under these circumstances have frequently made a quick passage to Auckland.

If bound to the southward, provided the weather be sufficiently clear to make the land, Cloudy bay affords good shelter at its head, as also port Underwood, according to circumstances.*

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* A steam vessel bound to port Nicholson through Cook strait and meeting a south-easter might make a good passage, by anchoring first in Current basin, from there steaming through French pass and Admiralty bay before the first of the southerly stream commences, enabling her to have the whole of that stream after rounding Francis head; passing between the Chetwode islands and Harding point, steering close by Motu-ngara island and capes Lambert and Jackson. If after passing the latter cape there is a possibility of reaching port Nicholson during that tide she should stand over for the east shore of Cook strait, as there the tide runs stronger; if there is no chance of saving the tide, she had better go up Queen Charlotte sound for Tory channel, anchoring, if necessary, in Oyster bay, from thence she would easily reach port Nicholson the next favourable tide.—Remarks by Navigating Lieutenant T. H. Tizard, H.M.S. *Challenger*, 1874.

To a vessel entering Cook strait from the westward and meeting a south-east gale, port Gore or Guards bay offer good shelter, if she is far enough advanced to fetch them; if not she may run for port Hardy, or to the westward of D'Urville island for Croisilles harbour. With time and daylight permitting, this latter anchorage is to be preferred, for the heavy swell raised by the tides across the narrow entrance of port Hardy, renders it more a steamer's than a sailing vessel's harbour.*

Prevailing winds.—South-easterly gales are most frequent and blow with the greatest violence during the winter months of May, June, and July; a falling barometer is a certain indication; they come on very suddenly, last often three or four days, and are generally accompanied with rain and thick weather. North-west gales are more common in spring and summer; they are generally of short duration, but are exceedingly violent in the squalls; at their strongest they raise a high barometer.

The harbour-master at Wellington observes, "that a rapidly falling barometer and a sultry atmosphere, are almost sure indications of a shift of wind to the southward, particularly during the summer months, when the wind often shifts very suddenly and blows fresh for a few hours, and then gradually subsides. In winter the southerly gales often come in gradually with small rain, and last longer. As a rule there is less wind in the vicinity of port Nicholson during the winter than the summer."

COAST WESTWARD of PORT NICHOLSON.—

Lyall bay is three-quarters of a mile westward of Palmer head, and runs to the northward nearly a mile, terminating in a curvilinear sandy beach, with low land extending across to Evans bay; it is three-quarters of a mile wide, and has 6 fathoms in the centre, but is totally unfit for an anchorage, on account of the reefs which project off either point, and its exposure to the full force of southerly or south-east gales.†

Luhrs rock.—A sunken rock (on which the *Sophia R. Luhrs* struck) is said to lie about 1½ cables E. by S. from the extreme of the reef which extends from the west entrance point of Lyall bay. This rock has about 17 feet on it at low-water springs.

Signal station.—Immediately westward of the head of Lyall bay is mount Albert, 590 feet high, on which is a signal-staff, whence the approach of vessels is telegraphed to the town.

Telegraph.—The telegraph cable crosses Cook strait from Lyall bay to Blenheim on the Wairau river, in the province of Marlborough.

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* *See* foot note page 176.

† *See* Admiralty coast chart, sheet V., Cook strait and coast to cape Egmont, No. 2,054; scale, $m = 0\cdot25$ of an inch; and Cook strait, No. 695; scale, $m = 0\cdot5$ of an inch.

Reef islet lies three-quarters of a mile westward of Lyall bay, and is surrounded by rocks, with a boat channel of 20 feet between it and the shore.

Sinclair head, a high bold cliff, lies 5 miles S.W. by W. ¼ W. from Palmer head, and has foul rocky ground extending nearly half a mile off it; the Happy valley peaks, at one and 2 miles inland of it, rise to a height of 1,700 feet.

The intervening coast is indented with small sandy bays, and fringed with rocks, which extend off all the points from 3 cables to nearly half a mile; the land is moderately high, and increases in elevation to the westward.

From Sinclair head the coast trends about W.N.W. towards cape Terawiti, which is 6½ miles distant; between these two headlands, 2½ miles westward of the former, is Tongue point, low and projecting, between which and Sinclair head lie the following dangers to be avoided in approaching port Nicholson from the westward :—

Karori or Seal rock stands high out of the water; it bears from Tongue point S.W. half a mile, and is not connected with it, although a reef runs off that point for a considerable distance.

Luna rock, found by Captain Fairchild in 1877, has a depth of 6 feet, and lies about half a mile off shore with Karori rock bearing S.E. by E., nearly 9 cables distant, and Macmanaman's house E. by N. ¾ N. The rock is steep to.

Toms rock, only just awash at low springs, lies S.E. by E. ½ E. one mile from Karori rock, and a quarter of a mile outside a line drawn from that rock to the extreme of the reef off Sinclair head, being a short mile from the shore, and immediately off the Karori stream.

Bank.—About three-quarters of a mile to the southward of Toms rock, is a bank having a depth of 6 to 10 fathoms. From the depth of 6 fathoms, Karori river bears N. ½ E., and Karori rock is in line with cape Terawiti bearing N.W.

Tide rips may be observed on this bank, especially at flood tide.

To avoid this bank when passing the coast between cape Terawiti and Sinclair head, cape Terawiti should be kept well open westward of Karori rock, and Pencarrow lighthouse open southward of Sinclair head.

Caution.—A rock has been reported lying S. ½ W. two-thirds of a mile from Toms rock; the above-mentioned clearing marks will lead clear.

As the stream sets towards the coast between Sinclair head and cape Terawiti, caution is requisite in passing the sunken dangers.

Ripplings.—There are 10 and 12 fathoms a short distance outside Karori and Toms rocks, but heavy tide ripplings with irregular rocky bottom extend nearly 3 miles off them.

CAPE TERAWITI.—From Tongue point the coast is bold and cliffy to cape Terawiti; the land continues high until it descends into the Oterangi valley, which is close to the eastward of Terawiti hill and nearly isolates it. The cape is a remarkable bold headland, rising immediately from the coast into an almost semicircular hill; its well-marked convex outline, as seen from the northward or southward, renders it difficult to be mistaken; it is also remarkable as being the salient point on this eastern side of Cook strait.

DIRECTIONS for MAKING PORT NICHOLSON from the WESTWARD.—Having described the dangers which exist immediately to the westward of port Nicholson, remarks are added for making the port coming from that direction.

Tides.—The narrowest part of Cook strait is formed by cape Terawiti and Wellington head, the latter bearing from the former W. ¾ N. 12 miles. It is high water, in the centre of the strait here, on full and change days at 8h. 0m.; the flood or northerly stream commences at 4h. 0m. and runs until 10h. 0m., the strength of the tide varying from one to 4 knots.

Heavy tide ripplings are experienced in the central part of the strait between these two heads, where there is uneven bottom, the depths varying from 80 to 122 fathoms sand. Tide ripplings also extend off cape Terawiti 2 miles, and for nearly 3 miles off Karori rock; eastward of Sinclair head these tide ripplings cease.

Running for port Nicholson from the northward or westward with a fair wind, cape Terawiti should be passed at a distance of from 2 or 3 miles, and the continuous coast not approached nearer until arrived between Karori rock and Sinclair head, when a vessel may haul gradually up towards the latter, (taking care to keep Pencarrow lighthouse well open, to avoid Toms rock and the one reported to exist outside it,) and passing about one mile from the points of land to the eastward of Sinclair head, until Barret reef opens out, when she may steer boldly for the southern end of the latter, passing it if necessary half a cable distant, as before described.

The course from the berth recommended off cape Terawiti is S.E. by E. ½ E. for 7 miles to abreast Sinclair head, thence N.E. by E., or when Palmer head opens out, a ship will then be clear of the reported rock, nearly the same distance to Barret reef. During daylight all the outlying dangers can be seen except the Luna and Toms rocks, and the rock reported to the southward of Toms rock.

Caution.—The tide between cape Terawiti and Sinclair head runs during springs 5 knots, and it is only with a commanding breeze that a vessel can stem it; hence it is necessary, particularly with the flood stream, to give the coast a berth of 2 or 3 miles, as unless great attention is paid to the steerage, vessels are in danger of being set too close to the detached rocks. Eastward of Sinclair head, and inside a line between it and Baring head, the tides are not much felt, and generally there is an eddy with the flood, setting to the eastward along shore towards the entrance.

Overfalls exist 6 and 7 miles S.W. of Sinclair head; and the heavy ripplings which occur during spring tides are highly dangerous to small coasters, especially at night, unless proper precautions are taken before entering them.

COAST NORTHWARD OF CAPE TERAWITI.—From cape Terawiti the coast turns abruptly to N.N.E. towards the small harbour of Porirua, distant 16 miles, and is a rugged cliffy shore fronted with straggling rocks; at 1½ miles off the soundings vary from 25 to 35 fathoms. Oharui bight lies nearly 7 miles from the cape, and in moderate weather boats may land there, the distance by road to the town of Wellington being only 4½ miles.

PORIRUA HARBOUR is only available for small vessels; but in fine weather, and with off-shore winds, large vessels may anchor within the line of the outer heads.*

Nearly in the centre of the entrance, half a mile northward of the south head, is a cluster of rocks, uncovered 3 feet at high water, abreast which on either side are 4½ fathoms; within these rocks a bar of shoal water extends from north to south, having 9 feet a cable inside the inner rock, and 4 feet a quarter of a mile within it.

The harbour runs south-eastward 1½ miles from these rocks, and at the distance of one mile narrows to scarcely 2 cables; coasters drawing 8 feet may enter at high water or three-quarters flood; when over the shoalest part, which is little more than half a mile above the centre rocks, and only a cable across, the water deepens to 15 feet, and half a mile higher up to 5, 6, and 7 fathoms; here the harbour branches off into two arms, one running to the eastward, and the other to the southward.

"The best channel is between the south head and the rocks, and nearest the latter; when the reef off the north head opens eastward of the rocks, haul up south-eastward for the entrance of the harbour, giving the mainland to the south a fair berth as the shore is rocky; the opposite side is sand."†

The outer anchorage for large vessels is in the bay immediately within the north head; but if the wind should shift to the north-west, it is necessary to proceed for the anchorage under Mana island or run for the strait.

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* *See* Admiralty plan of Entry anchorage, Porirua harbour and Mana island, No. 2,588; scale, $m = \left\{\begin{matrix}4\cdot0\\3\cdot0\end{matrix}\right\}$ inches.

† Harbour-master, Wellington, 1880.

Porirua harbour by land is 12 miles from the town of Wellington, with an excellent road the whole way.

Tides.—It is high water, full and change, at Porirua at 7h. 0m.; the rise of tide from 6 to 8 feet. The flood or northerly stream begins in the offing at 5h. 0m., and the ebb or southerly at 11h. 0m.

MANA, or Table island, is 13 miles N. by E. ½ E. of cape Terawiti, and 2½ miles westward of the entrance of Porirua harbour. It is flat-topped, 1⅓ miles long, half a mile wide, and 440 feet high, and is covered with pasture; the northern and western sides are high and precipitous, with scattered rocks extending more than a cable off shore: on the eastern side the land is sloping; the south-east point is a shingle beach. In clear weather mount Egmont is visible from the north-west summit bearing N.W. by N., 112 miles.*

Mana island lies nearly 1½ miles from the mainland, to which a bar called the Bridge extends from its south-east point, which may be crossed in 21 feet at low water, by keeping a quarter of a mile from the point of the island, but deeper water will be found in mid-channel; there is generally a heavy tide rippling on the Bridge, and the tides run from one to 3 knots.

Anchorage.—Anchorage will be found under the south-east end of Mana, to the southward of the Bridge, sheltered from north-west winds, one-third of a mile off the island point in 8 fathoms. H.M. ships *Calliope* and *Driver* both rode out strong gales from north-west at this anchorage.

"There is good anchorage under Mana island on its south-east side during N.W. gales, in a small bight north of the Bridge. With southerly winds a small vessel may shift to leeward of the next shingle point to the north, and ride safely; larger vessels may shift over to what is termed the Coalheaver, about 1½ miles to the southward of Porirua harbour, and anchor in from 5 to 8 fathoms water, with the centre of Kapiti in line with the north head of Porirua bay."†

COAST NORTHWARD of PORIRUA HARBOUR.—For nearly 3 miles northward of Porirua harbour the coast is high and cliffy, with straggling rocks extending off shore fully half a mile;—Gibraltar, a high square rock standing close to the shore, with a reef outside it, being the northernmost; hence the coast trends with a gentle curve and sandy beach to the northward for 11 miles to Waikanai, a native settlement on the bank of a small river, which is navigable for large boats at high water. There are from 9 to 14 fathoms 1½ miles off this part of the coast.

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* *See* Admiralty plan of Entry anchorage, Porirua harbour and Mana island, No. 2,588; scale, $m = \left\{\begin{matrix}4\cdot0\\3\cdot0\end{matrix}\right\}$ inches.

† Harbour-master, Wellington

KAPITI ISLAND, (the Entry island of Cook,) is a prominent object entering Cook strait from the westward; its south end bears from Mana island N. ½ E. 12 miles, and the nearest part of the mainland, (Waikanai river,) bears S.E. ½ S. 3 miles from its north end. Kapiti is 5 miles long in a north and south direction, or nearly parallel to the line of coast, and 1¼ miles in width; it is wooded and mountainous, the highest peak rising to a height of 1,780 feet in the centre of the island; the western side is precipitous, the hills rising abruptly from the sea; on the eastern side it slopes somewhat more gradually towards the beach, and is intersected by deep ravines.

Long point, its north-east extreme, is a low rounding flat shingle point, extending nearly half a mile from the foot of the hills, with a small lake in the centre: close under this point there is shelter for a few small vessels from north-west winds, but they should not lie here with any sign of a south-easter; several coasters have been thrown on the beach and wrecked by doing so.

Entry anchorage, at the south-eastern end of Kapiti, is formed by three small conical-shaped islets, which, together with the reefs extending off them, afford good shelter from south-east winds, and is protected from the north-west by Kapiti itself. The two southernmost islets, Hiko and Mahew, each about half a mile in circumference, lie nearly one mile eastward of the south-east extreme of Kapiti, and within a cable of each other; a reef also encircles both, and extends more than a cable southward of Mahew, the outer islet. Between Hiko and Kapiti there is a channel a cable wide, with a depth of 15 feet.*

Evans islet, or the Sugar-loaf, lies little more than a mile to the N.E. of Hiko and Mahew islets, and three-quarters of a mile from Kapiti: the Passage rocks exist midway between Evans islet and Kapiti; they are awash, with kelp round them; there is a passage for large vessels on either side of these rocks, but that between Passage rocks and Evans islet is narrow. A reef of rocks above water extends from Evans islet to the southward 3 cables, with straggling rocks awash at low water off its extreme.

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* *See* Admiralty plan of Entry anchorage, Porirua harbour and Mana island, No. 2,588; scale, $m = \left\{\begin{matrix} 4\cdot0 \\ 3\cdot0 \end{matrix}\right\}$ inches.

To enter the anchorage, pass between the end of this reef and Mahew islet, the breadth of the passage being nearly one mile: the general depth of water within this boundary is from 17 to 12 fathoms; and with the centre of Mahew islet bearing South distant 4 cables, anchorage will be found in the latter depth, over sand and coral bottom, a quarter of a mile from the shore of Kapiti: inside this berth the water shoals rather suddenly. Extensive whaling establishments formerly existed on the islets, and whalers have ridden out the whole winter gales at this anchorage.

Soundings.—Between Kapiti and the mainland there is a general depth of from 20 to 30 fathoms, and the channel is clear of dangers, excepting the reefs which extend off the islets; one mile seaward of the island the soundings vary from 40 to 50 fathoms.

Tides.—It is high water, full and change, at Kapiti island at 9h. 0m.; the rise of tide 6 to 8 feet. In the offing the flood, or northerly stream, makes at 5h. 30m., and the ebb at 11h. 30m.

COAST NORTHWARD OF KAPITI.—From Waikanai river the coast trends N. ¾ E., with an almost straight sandy beach, for 27 miles to the Manawatu river, the Otaki and Oahau rivers, navigable for large boats at high water, lying between, the former 9, and the latter 14 miles from Waikanai; there are besides several small streams always fordable.

At Otaki is a considerable native village, with a large and handsome church, famous as of native workmanship. Sandhills from 20 to 40 feet high fringe the coast from a half to one mile inland, when a fine level tract of country extends to the foot of the near mountain range, a distance of 6 or 7 miles at Waikanai; this high range recedes to the eastward as it extends north, the level and fertile land about Manawatu river extending inland nearly 20 miles to its base.

MANAWATU RIVER may be known from the offing by a remarkable grove of trees on the north side, nearly 3 miles from the entrance; it is easier of access than any other river on this coast, the channel being straight; and although the depth varies after heavy gales or floods, the bar has not been known to shift in direction. It is 250 yards across at the mouth, and a short distance inside becomes exceedingly tortuous in its course, intersecting the Rua-hine range, (a high chain of mountains extending north and south nearly through the centre of the island,) and branching off into many arms to the eastward; between one of which, and the Ahuriri river flowing into Hawke bay, there is said to be easy communication.

The Pilot station, situated on the northern side of the river entrance, is distinctly seen from seaward. The International code, the Colonial Tide and Danger or Bar signals, may be used.

The pilot will board inward-bound vessels inside the bar if required.*

Beacons.—Two moveable beacons have been erected, which kept in line lead over the bar, and may be seen from a distance of 2 or 3 miles. The outer beacon is painted red; the inner black.

LIGHT.—A *fixed* white light elevated 44 feet above the level of the sea, is exhibited on a flagstaff from the south entrance point of Manawatu river, and is visible in clear weather from a distance of 9 miles.

In addition to this light, there will also be shown, when the Bar is practicable, a *green* light from the outer beacon, and a *red* light from the inner beacon.

Tides.—It is high water, full and change, at Manawatu bar at 9h. 50m.; springs rise 8 feet, neaps 6 feet.

There is a depth of 3 to 4 feet water on the bar of the Manawatu at low water springs, and vessels drawing 9 feet may enter at high water and proceed 30 miles from its mouth.

"Having crossed the Bar, keep the south spit well on board till the buoys are seen; thence steer keeping the red buoys on starboard side, and black buoys on port; black and white beacons to be kept in one. In crossing the river from side to side by these directions, vessels will carry 10 to 12 feet at springs across the flats as far as the town of Foxton."†

RANGITIKI RIVER, the next river northward, is 9½ miles from the Manawatu. Coasters drawing 4 to 5 feet may enter at high water; and it is navigable for canoes or boats 50 miles; a mile above the entrance it is fordable at low water.

The land here is among the best in New Zealand; for many miles inland it is level and clear of wood, with excellent pasture for cattle; flax is also cleaned by the natives, and exported to some extent.

The coast from Rangitiki river trends north-westerly towards Wanganui river, which is 23 miles distant, being of the same character as that already described, a sandy beach skirted with low sand-hills. The small rivers Wangahu, and Turakini, lie to the southward of Wanganui, the former 7 and the latter 9 miles from it; they are about 20 yards wide at their mouths, and only navigable for boats, their bars being dry at low water.

WANGANUI RIVER entrance bears from the north end of Kapiti island N. by W. 52 miles; it lies in the depth of the great bight between cape Terawiti and cape Egmont, and about an equal distance from both.

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* The pilot shows the colonial bar and danger signals (page 15), and will guide vessels with the semaphore arm. From New Zealand Almanac, 1874.

† Harbour-master, Wellington.

In clear weather mounts Egmont, Tongariro, and Ruapehu* are distinctly visible from it, when the best guide for the entrance is Tauperi (or the Devil's thumb), a remarkable sharp double-peaked hill, 1,860 feet high, about 15 miles inland, bearing N. by E. ¾ E., in line with Ruapehu mountain; this leads directly for the entrance. When these mountains cannot be seen, the Seven hummocks are a good guide to the river. These are a remarkable range of hillocks to the northward of Wanganui, 8 miles from the coast, and extending in an east and west direction for 3 miles, the easternmost one bearing from the entrance of the river N.N.W. ¾ W. 12 miles.

The Landguard, a remarkable bluff head about 100 feet high, on the south side of the river, 2 miles from the south entrance point, is also a prominent object.

The North head is a castellated cliff, about 60 feet high, with a flagstaff and pilot-station. The southern point is of low sandhills, and has two beacons on it; these beacons were originally intended as leading marks through the channels; but the bar has shifted considerably since their erection, and continues to do so after gales or heavy floods, so that they now merely serve to mark the entrance. There is a depth of 8 feet at low water on the bar, which has three narrow channels; the middle and southern of these were the deepest in 1864.†

Local signals.—Two movable beacons (inner the higher), have been erected on North head, from which are shown, when the tide serves and the bar is safe, red flags by day and *red* lights at night—these now serve for crossing the bar, instead of the beacon and signal mast as heretofore.

Crossing the bar during the day, these two beacons should be kept in line; particular attention also being paid to the semaphore arm (used for guiding vessels inside the bar), on account of the curves in the channel.

Crossing the bar at night, the two *red* lights of the beacons should be kept in line; particular attention being paid to the *green* light, which will be used like the semaphore arm, for guiding vessels inside the bar. This *green* light travels on a yard on the outer beacon, and vessels must be steered in the direction in which the light is moved.

NOTE.—Vessels arriving off Wanganui bar at night, should burn flash or blue lights to make their positions known to the look-out at the pilot station, who will answer the signal with a torch or flare light.

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* Ruapehu, an extinct volcano, is 9,195 feet high. Tongariro, an active volcano, is about 7 miles to the northward of Ruapehu; from most points of view seaward they appear as one mountain. Tongariro was ascended in 1839 by Mr. Bidwill, who estimated its height to be 6,200 feet above the level of the sea.

† The best time to enter Wanganui river is from half flood to high water, leaving the red buoy on starboard hand, and the black on port hand, the vessel being guided from the signal staff (see page 15 for signals). From New Zealand Almanac, 1874.

Sailing vessels should not attempt to cross the bar at night, as then the wind generally dies away or draws off the land.

"**Signals for vessels bound out when others are outside waiting to come in.**—Red flag, half-mast high.—Bar is safe for sailing vessels outwards.

White flag, half-mast high.—Bar is not safe for sailing vessels outwards.

For steamers towing.—Pendant with red flag under, at mast-head.—Bar is safe for towing.

Pendant with white flag under, at mast-head.—Bar is not safe for towing.

Signalling to town.—White flag with blue square in centre, at yard-arm.—Vessel on shore or on the bar.

Pendant at mast-head.—Steamers can cross the bar outwards.

Two pendants at mast-head.—Steamers cannot cross the bar outwards."[*]

"**Night signals for vessels in the river bound out.**—*Green* light on bluff.—Bar dangerous.

Red light on bluff.—Bar safe."[†]

LIGHT.—There is a white *fixed* light exhibited from the flagstaff on Castle cliff (North head) Wanganui, 65 feet above high water, which in clear weather should be seen 13 miles.

Caution.—Masters of vessels are warned that this is not a guiding light to clear any dangers, but is intended solely to enable them to keep their position off the port.

Harbour lights.—*Red* harbour lights are exhibited from each of the lower extremities of the Training walls, situated about half a mile above Landguard bluff, to be moved down the river as the work progresses.

A fixed *green* leading light is exhibited from beacon No. 4, northern bank of river, visible both up and down the river.

The coasting trade is carried on by vessels of about 25 tons burthen, but the river is navigable as high as the town of Petre for craft of 10 and 12 feet draught. Petre is built on the north side of the river, 4 miles from the heads.[‡]

Wanganui river can only be entered in fine weather and with a leading wind; when with a pilot, who will board inward-bound vessels when requested by signal to do so, or local knowledge of the entrance, a vessel of the draught before mentioned may cross the bar in safety; in fresh westerly winds it is one unbroken line of surf. There are 8 fathoms in the offing one mile from the entrance, where vessels may anchor in fine weather.*

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[*] Harbour Master.

[†] Nelson Almanac.

[‡] It numbered in 1871, 2,390 inhabitants, carries on a direct trade with Sydney and Melbourne and had a little steamer making fortnightly trips to Wellington and Nelson.

"The bar is from three-quarters to one mile from the entrance, and shifts considerably during the year, according to weather, &c. There is a depth of 11 to 14 feet water on the bar at high-water springs, when the rise of tide is 6 to 7 feet, and at neaps 3 to 5 feet.

"When inside the heads, haul to the southward round the end of the south spit, and steer for Landguard bluff, when the beacons on the Training walls will be seen. Keep red beacons on starboard and black beacons on port side."†‡

The coast is not dangerous, as has been generally supposed; with the prevailing winds, (north-west and south-east,) an offing can always be gained; with westerly or south-westerly winds, a vessel should not get embayed if there is any prospect of bad weather, but wait under Kapiti island for an opportunity of entering the river.

Telegraph.—The shore end of the second Cook strait submarine cable from Wakapuake, near Nelson, is landed at Wanganui.

Soundings.—Between Kapiti island and Wanganui river the water shoals gradually; there are from 40 to 50 fathoms 10 miles from the shore, until within 10 miles of the latter place, when it decreases to 30 fathoms, and shoals gradually to 9 fathoms within one mile of the beach.

Tides.—It is high water, full and change, at Wanganui heads at 10h. 15m.; the rise from 6 to 8 feet; the flood runs in 5 hours, and the ebb out for 7 hours. On the adjacent coast the flood runs to the northward, and the ebb to the southward, from one to 1½ knots.

WANGANUI RIVER to CAPE EGMONT.—From Wanganui river the coast trends westerly towards cape Egmont, distant from it 73 miles, and the features of the land become entirely changed; the sandy beach and low land extending the whole distance from Waikanai now give place to perpendicular cliffs from 80 to 100 feet high, composed of blue clay, which the sea washes at high water.

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* H.M.S. *Esk*, on the 10th March 1865, rode out a heavy gale from south-east off Wanganui, in 9 fathoms water, with the following bearings:—extreme of Landguard N.E. by E.; Tauperi N. by E. ¾ E.; house on Cliff end, N. by E.; centre of Seven Hummocks, N.N.W. ¼ W. The coming of the gale was indicated the previous night by the clouds passing rapidly over the moon towards the south-east, and the land and distant objects standing out with remarkable clearness; during the height of the gale the sea broke in 6 fathoms; 24 hours from its commencement there was a dead calm, and the sea went down as rapidly as it rose.—Remarks by E. W. Creak, Master H.M.S. *Esk*.

† Brett's New Zealand Pilot, 1880.

‡ The Marine Department, Wellington, has notified, that since November 1882, a dredge has been at work in Wanganui river, from which the following signals are shown for the guidance of shipping in entering:—

By day.—A red ball signifies, leave the dredger on starboard hand; a green ball, on port hand.

By night.—*Red* light below a white one, leave dredger on starboard hand; *green* light below white, on port hand.

The only rivers along this whole extent of coast are the Waitotara and Wenuakura, navigable for boats, and Patea, the former 15 miles and the two latter (within a mile of each other) 24 miles from Wanganui river.

Waitotara point, a low sandy projection, is 13 miles westward of Wanganui, and 2½ miles south-east of the river of the same name. The clay cliffs commence again immediately to the westward of it, and continue to Waipipi, which is also a low sandy point, and the last on the coast, 3½ miles south-eastward of Patea river.

Patea light.—A harbour light is exhibited from a lighthouse, erected on a cliff 70 feet high, on the eastern side of Patea river entrance. The light is a fixed *red* light 130 feet above high water, and visible in clear weather from a distance of about 5 miles.

"The flagstaff and pilot-station are on the cliff on which the lighthouse stands. The bar has shifted very little since the harbour works have been in progress. It has a depth of 10 to 13 feet at high-water springs, which at full and change is 10h.; rise 5 to 9 feet; the flood runs 5 hours, and the ebb 7 hours.

"A rubble and concrete breakwater 1,100 feet long and 20 feet wide, is being constructed, which keeps the bar and channel straight. Other works are in contemplation with the view of improving the bar and to facilitate navigation.

"The course over the bar is N.N.E.; good tides may be expected with northerly winds, and the reverse with southerly. The prevailing winds are from west to north-west.

"An iron beacon with a ball marks the end of the breakwater; and an iron beacon with a flag, the low-water mark on the north spit. The width from the breakwater to the north spit is 139 feet, the depth of water at end of breakwater 23 feet, and along it 17 feet. Vessels should keep the breakwater on board, distant 20 to 30 feet, until passing the second iron beacon on the east side, then steer over to the port shore.

"Two shifting beacons—inner one the highest—are erected on a sand hill by the flagstaff, from which are shown when the tide serves and the bar safe;—by day, flag W. on outer beacon, and flag M. on the inner beacon, both to be kept in one when crossing the bar, paying particular attention to the pilot guiding. Steamers can cross the bar at night in moderate weather, when a *red* light is shown on the outer and a white light on the inner beacon, also a *green* light to guide.

"SIGNALS.

"Red flag, half-mast high.—Bar safe for sailing vessels outwards.

"Pendant with red flag under, at masthead.—Bar is safe for towing.

"Pendant at masthead.—Steamers can cross the bar outward.

"Two pendants at masthead.—Steamers cannot cross the bar outwards.

"In moderate weather, vessels may approach safely within signalling distance, and anchor with the flagstaff N. by W. or the lighthouse N.N.W. in 6 and 7 fathoms. A good buoy rope is necessary, as the ground is foul in places. Freshes mostly occur from June to August, and scour the river thoroughly, but do no damage to shipping. Sailing vessels, during a heavy fresh, cannot enter without a strong fair wind. The port is best suited for vessels drawing 5 to 8 feet, but those drawing 9 and 10 can enter at springs. There are two wharves on the west side, which can discharge 60 to 80 tons per day, and others are in course of construction. The river, from the bar to bridge, has an average depth of 15 feet."*

From Patea the coast recedes gradually round Waimate bight, at whose northern limit is the site of the celebrated Waimate pah;† this bight is a slight indentation of the coast, 23 miles in extent, affording no shelter, the coast being an unbroken line of cliffs averaging 100 feet high; from the summit of these cliffs the level land covered with flax and brushwood extends some distance, rising very gradually as it approaches the base of mount Egmont.

About 5 miles westward of Waimate pah is the Kaipokonui stream, which takes its rise in mount Egmont; it is a rapid stream, bringing large boulder stones down during the summer floods, at which season it is dangerous to cross; it is not navigable even for canoes at the entrance.

At 7 miles north-west of Kaipokonui stream, is Otumutua point, and 5 miles north-west of this point is Opunake bay.

OPUNAKE BAY.—This anchorage, only fitting for steamers and small sailing vessels, is one mile south-east of the site of Te-nama pah. Opunake bay is of horse-shoe shape and about one-third of a mile deep, with high cliffs round the shore. The north-west head extends 200 yards seaward of south-east head. The bay is sheltered from winds between south-east round by east, to north-west.

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* Brett's New Zealand Pilot, 1880.

† Waimate pah was formerly one of the strongholds of the natives, but, like all their other defensive positions on the coast, has been for a long time deserted, as they have retired to the more peaceful occupation of cultivating the soil a short distance inland. This pah has been the scene of many a sanguinary struggle, and is in an almost impregnable position; it is nearly insulated, being joined to the main by two narrow shingle spits; on the outer side it is a perpendicular cliff 100 feet high, and on the land side there is a natural ditch with apparently deep water in it. The summit does not occupy a space of more than a hundred square yards, and is covered with pits for the reception of provisions as well as for shelter.

This pah was attacked by H.M.S. *Alligator* in 1830, and the natives severely punished, in consequence of an affray between them and the crew of the *Harriet*, a merchant vessel wrecked near cape Egmont, and where most of the latter were murdered: a esleyan Mission station, under the Rev. Mr. Woon, was at that time established one distant from Waimate pah.

Landing.—The accommodation for landing and shipping in 1880 consisted of one cargo boat capable of carrying 2 tons in moderate weather, and is in charge of the signalman, who collects a crew of constabulary when required. The boat is worked in the same way as at New Plymouth, with a rope attached to the warping buoy. Small vessels can beach in fine settled weather, when the beach is remarkably smooth.

Reefs.—A reef extends from the north-west head half a mile in a southerly and south-westerly direction; there is also a reef off the south-east head in a south-westerly and westerly direction about one-third of a mile. These reefs shelter the bay at low water in bad weather, breaking the sea before it reaches the beach.

The channel in to Opunake bay is one-third of a mile wide between these reefs, with a depth of water of 8, 7, 6, 5 to 4 fathoms at low-water. The distance from head to head at low water is about one-third of a mile.

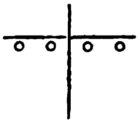
There is a sandy beach in the centre of the bay, about 250 yards long. Detached rocks lie under water about half a cable from low-water mark, and nearly 1½ cables from the north-west shore, with 4 feet on them at low water; they are well out of the way of the anchorage.

Beacons.—Two black beacons are erected on the north-west side of the bay to mark the best anchorage; the upper beacon is 20 feet and the lower beacon 10 feet high, they are 380 feet apart, and bear from each other N.W. ½ W. and S.E. ½ E. When they are in line, a vessel is sufficiently close in to have room to swing. A white beacon 10 feet high, is placed 96 feet S.S.W. ¾ W. from the flagstaff (situated at the head of the bay), and is intended as a leading mark into the bay.

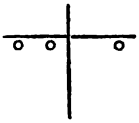
Directions.—A vessel bound for Opunake should keep about 2 miles off shore until the flagstaff bears N.N.E. ¾ E. then steer in on that bearing until the white beacon in front of the flagstaff is seen; keep this beacon and flagstaff in line, bearing N.N.E. ¾ E. until the two black beacons on the port hand are in line bearing N.W. ½ W.; then anchor in 4 fathoms, stony bottom. Should the wind be strong from south-east or north-west, keep a little to windward, where will be found the smoothest water, with nearly a cable swinging room. Sailing vessels of 50 tons or upwards, should anchor about three-quarters of a mile off the heads in 10 fathoms rocky bottom, on the following bearings:—Otumutua point S.E. by E. ½ E., and the flagstaff N.N.E. ½ E.; and be prepared on the first appearance of strong on-shore winds to proceed to sea.

Tides.—It is high water, full and change, at Opunake at 9h. 45 m.; range of tide 7 to 10 feet.

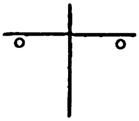
Signals.*—The following signals are used at Opunake:—



Stand in with safety.



Anchorage in the bay unsafe, but vessel can anchor outside and a boat will be sent.



Bay dangerous, keep to sea.

Night signals.—White light over *red*—Wait till daylight; anchorage safe.—*Red* light over white—Bay dangerous; keep off.

From Opunake the coast trends first north-westerly, then northerly and easterly to New Plymouth (*Taranaki*), its westernmost projection being cape Egmont. The configuration of the coast line here is so uniformly circular, that supposing a pair of compasses were planted on the summit of mount Egmont, with a radius of 15 miles, and a semicircle were then described, it would be an almost accurate delineation of the coast for a distance of 45 miles, or from the Kaipokonui stream to New Plymouth.

CAPE EGMONT.—Nine miles southward of cape Egmont the cliffs terminate, and the coast thence to the Sugar-loaf of New Plymouth is low and rocky, with sandy or shingle beaches. Cape Egmont itself has no distinguishing feature, being a slight projection from the general curve; it bears from the summit of the mountain W. by S. distant 15 miles. 3¼ miles south of the cape is Harriet bay, a sandy beach 2 miles in extent, where the vessel before mentioned ran on shore and was lost; her anchor may still (1866) be seen buried in the sand, flukes uppermost; this bay is about the only spot on the coast where a vessel could be beached, as from all other parts rocky ledges extend for some distance from the shore.

LIGHT.—An iron lighthouse 67 feet high, painted white, stands on cape Egmont 259 yards within the high-water mark, whence is exhibited at an elevation of 103 feet above the sea, a *fixed* white light and visible seaward in clear weather, between the bearings of N. 23° W. and S. 5° W., from a distance of 15 miles.

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* For general signals, see page 15.

MOUNT EGMONT, standing alone as it does, and rising from a plain of inconsiderable elevation, is, although not the highest, certainly the most strikingly remarkable mountain in New Zealand, and may be seen from a vessel's deck in clear weather distinctly from a distance of more than 100 miles. It rises in a perfect cone from a base of 30 miles in diameter, to a height of 8,270 feet above the sea, and presents nearly the same appearance, viewed from every point; its summit, an extinct crater, is flattened, and covered with perpetual snow for nearly a quarter of its entire elevation. A saddle-shaped eminence rises to the north-west of the mountain to a height of 4,600 feet, as a kind of off-shoot; and in the same direction, 3 miles from the coast, is another range of a similar character, but much lower.

Soundings.—The approaches to the coast between Wanganui river and New Plymouth have not yet been extensively sounded; but in a line parallel with and 15 miles off shore, there are from 35 to 45 fathoms, dark sand; when mount Egmont bears N.N.E. the water deepens, and abreast cape Egmont, at the distance of 9 miles, there are 57 fathoms, mud; northward of the cape there are 35 and 38 fathoms, sand and stones, 2½ miles from the shore.

Caution.—Vessels rounding this cape are recommended to give it a berth of 5 miles, as outlying shoal spots are reported to exist.

NEW PLYMOUTH.—This settlement and roadstead is 20 miles north-eastward of cape Egmont; it is well marked from seaward by the Sugar-loaf islands, and by the still more remarkable dome-shaped hill Paretutu, or main Sugar-loaf, also by its proximity to mount Egmont.*

The coast for 15 miles eastward of this anchorage is fringed with reefs, extending three-quarters of a mile from the shore; Puke-tapu reef, which is 7 miles to the eastward, extends fully one mile from the shore.

The settlement flagstaff on mount Elliott is immediately above the landing-place, and close to the occupied portion of the town site; from it mount Egmont bears S. 1° 12′ W. (*true*) 14·45 miles, and Motu-roa, the highest of the Sugar-loaf islands, N. 77° 43′ W. (*true*) 2·05 miles.

Roadstead.—The roadstead extends from the Sugar-loaf islands to a line north of the flagstaff; at an average distance of 1¼ miles from the shore there is an uniform depth of from 10 to 12 fathoms; it is, however, not prudent for vessels of any size beyond coasting craft to come within this depth, as the bottom becomes very foul.

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* *See* plan on Admiralty coast chart, sheet VI., Manukau harbour to cape Egmont, No. 2,535.

By an Act of the Colonial Legislature, the province alone is to be called Taranaki, the town retaining the name of New Plymouth.

Dangers.—A reef, covered in places with large boulders, and an irregularly attached rocky ledge, extends a long half mile from the shore, a short distance westward of the flag-staff; its eastern edge lies N.N.W., and its north extreme N.W. ½ N. from the flagstaff, and N.E. by E. ¾ E. from Motu-roa. The reef and ledge break in moderate weather, and shelter the landing-place from the prevalent south-west winds and swell. Care should be taken in leaving the anchorage, not to bring the flagstaff to the eastward of S.S.E. till the outer Sugar-loaf bears W.S.W., when a vessel will be outside it.

Another reef extends one-third of a mile off-shore, at about 2 cables to the eastward of the inner anchorage; but as this anchorage is only used by steamers and small vessels, there is ample room to get under weigh.

The chief harbour-master at New Plymouth reports the existence, off the landing-place in the eastern part of the roadstead, of a shoal, upon which there is a depth of 17 feet at low-water spring tides. The shoal, consisting of large flat-topped stones, is about 20 yards across, with 4½ fathoms around it. From the centre of the shoal, the flagstaff distant half a mile, is in line with a farmhouse in the centre of a clump of trees, bearing S. ¼ E.; and the two white beacons on the sand-hills westward of the landing-place are in line bearing S.W. by S. These beacons in line, lead over the shoal, and kept open will lead clear on either side.

Anchorage.—The best anchorage is in 12 fathoms at low water, with the Wesleyan Mission school, a remarkable building on elevated ground, midway between the town and Sugar-loaf islands, in a line with mount Egmont bearing S. by E. ¾ E.; and the Seal rock midway between the two large Sugar-loaf islands, bearing S.W. ½ S. The flagstaff will then bear S.E. by E. ½ E. distant 1¾ miles.*

The anchorage now used by trading vessels of all classes extends along a line bearing N. ½ W. from the flagstaff on mount Elliott (a slight elevation behind the boat sheds). Large vessels anchor from one to 1¼ miles from the shore in 8 to 9 fathoms, sand and rocks, the flagstaff bearing S. ½ E.

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* Formerly a set of moorings, capable of holding a ship of the line, were laid down by the New Zealand Company to show the best anchorage. From the constant friction of a portion of the bridle chains (2¼-inch iron) on the hard bottom, and possibly a chemical action from the peculiar volcanic character of the district, the links were worn to one-half their original stoutness in 2 years, and parted while a ship of 500 tons was riding by them.

The present trade of New Plymouth scarcely warrants this outlay, neither can it support the constant expense and attention that moorings thus situated demand. It must also be observed that the settlement offers no resources for any repair of iron work, in the event of the moorings requiring it; and that for their examination, a large sailing vessel must be especially equipped for the service; this vessel while so engaged would have no harbour of refuge within 115 miles.

These moorings were far too large, and in the event of its being found expedient to [illegible] down others, anchors of 35 cwt. with proportionate chains would suffice.

The anchorage for steamers is somewhat under half a mile from high-water mark.

The roadstead is open to all winds from S.W. round by north to E.N.E. (eighteen points of the compass).

Light.—A fixed *red* harbour light is exhibited from the flagstaff on mount Elliott, elevated 75 feet above the sea, and is visible seaward, except where obscured by Sugar-loaf islands, from the bearing E. by N. to the land in the direction of Waitera (Waitara) river.

Moorings.—Moorings capable of holding vessels of 200 tons are laid down at about a mile from the shore, and marked by a large buoy; care must be taken not to anchor too near these moorings which lie N.E. and S.W., with 60 fathoms each way, and have a depth of 7 fathoms at low-water springs, there are other buoys farther in.

A small set also for sailing vessels of 100 tons and under, are laid down in 6 fathoms low-water springs, marked by a black buoy.

Directions.—A vessel from the westward bound for New Plymouth should make the outer Sugar-loaf island, and when it bears South one mile distant, steer E.S.E. until the same island bears W.S.W.; keep it

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The advantages to be derived from moorings in so exposed a situation are very problematical; an organized boat establishment would prevent the necessity of large vessels risking their ground tackle by anchoring at all, and prove vastly beneficial to the general trade of the settlement, at a comparatively trifling expense.

In general, landing can only be effected in a whale boat, or surf boat for general purposes, and under the guidance of an experienced resident boatman. The government establishment consisted of a beach-master and pilot, and a coxswain to take charge of the cargo boats (capable of carrying about 3 tons each) with a whale boat for general purposes; these boats perform all the duties of the settlement, both public and private; hey were manned, as occasion required, by idlers and labouring men seeking a job, natives or Europeans, as chance might offer, who were remunerated according to the number of hours employed. An experienced boat's crew could never be got together under the existing arrangements; time was lost, and the service often inefficiently performed. The boats were well adapted for the service, were carefully looked after, and had been so fortunate as to escape accident.

A warping buoy is laid down a short distance from the landing-place, and is useful for hauling the cargo boats through the surf; the buoy kept in line with the flagstaff islands is the best lead for the landing-place.

From the beach-master's report of several years' experience, he considers that a boat may be launched from the beach six days out of the seven, and the cargo boats worked five days out of seven on an average.—Extract from a Report on the Anchorage, by Mr. F. J. Evans, Master, R.N., H.M.S. *Acheron*, 1849.

"The landing arrangements are very perfect (1880), and performed with much expedition, 80 to 100 tons per day are landed with the greatest safety. The boats are hove up on dry ground by a steam winch, and rapidly discharged into carts.—*Harbour master.*"

on that bearing until the small white flagstaff on the beach (in front of the boat sheds) comes on with the flagstaff on mount Elliott bearing S. ½ E., the vessel will then be close to the outer mooring buoy. A vessel from the northward, with a fair wind, may run for the flagstaff on mount Elliott when bearing S. ½ E. continuing on this course until the outer Sugar-loaf bears W.S.W., which will bring her near the outer mooring buoy.

"A vessel running for the anchorage with strong S.W. winds should shorten sail in good time, so as to carry no more than is necessary to keep her under command when coming to, when cable should be veered, without checking, to 60 fathoms, to lessen risk of dragging. Vessels trading to this port should be provided with ground tackle of the very best quality, both anchors and chains, not less in weight and size than those prescribed in Lloyd's rules; as their safety may depend on the quality of their ground tackle. No vessel, however small, should have less than 60 fathoms of chain out. If lying at the inner anchorage, a vessel would have to work to windward to clear the reefs unless it should be high water."*

Caution.—If working to windward from north or north-east with S.W. winds, do not approach the coast eastward of the anchorage nearer than the depth of 7 fathoms, to avoid the reefs before described.

The general nature of the bottom appears to be rocky ledges, covered with a thin coating of dark-coloured sand, but north of the settlement it is strewed with large boulders and shingle. Vessels often experience a difficulty in weighing caused by the foul ground below the sand; a stout crown rope to ensure canting the anchor should always be employed. There is at all times a swell in the roads, and a vessel should leave with the first symptom of an on-shore wind, and therefore be prepared to slip; for this purpose it is better to use chain for the slip buoy, as the foul ground would be likely to cut rope. If obliged to slip, and the wind is N.N.W. or northward of that point, fill on the starboard tack, but if to the westward of N.N.W. slip on the port tack, and carry as much sail as the vessel will bear.

It is necessary to ensure casting the right way.

Wind.—Should the wind veer to north-west from south-west, through west, it may be looked on as certain that a strong on-shore wind will set in within 24 hours, however fine the weather may be when the change takes place.

In the event of having being obliged to slip, masters of vessels can obtain information of the state of the anchorage by closing the outer Sugar-loaf, when the harbour-master will inform them by signal what to do, vessels having often kept to sea in a strong south-west wind when there has been good working weather in the anchorage.

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* Harbour-master.

SUGAR-LOAF ISLANDS (*Nga-motu*) are a remarkable and appropriately named group; the most lofty and striking of these Sugar-loaves (*Paretutu*) rises from a low point of the adjacent mainland as a sharp cone, to an elevation of 503 feet. The inner islet (*Motu-roa*) is similar in character and 266 feet high, whilst the outer (*Motu-mahanga*) is saddle-backed with a conical summit 190 feet high.

Anchorage will be found in south-west winds under the inner Sugar-loaf island (Motu-roa) on the following bearings:—Paretutu in line with Miho-tahi, (a small rocky hill of the Sugar-loaf group which is an island at high water,) S.W. by S.; the centre of Motu-mahanga on with the north extreme of Motu-roa, West, in 5 fathoms water.

There is a deep passage between these islands, avoiding Barret reef, a half-tide rock, lying half a mile W.S.W. of Motu-roa, and passing on either hand of the Seal rocks, a cluster of some extent, the highest part having 35 feet elevation.

Winds and weather.—During the summer months (November to February) there are generally regular land and sea breezes, the latter from S.W., and light winds off the land during the night.

In the winter season the weather is variable, but the spring and fall of the year bring the strongest gales. S.W. or W.S.W. is the prevailing quarter; these winds throw a heavy swell round the Sugar-loaf islands into the anchorage. S.E. is the fine weather quarter, and with this wind mount Egmont is usually clear. N.W. winds, which blow directly on shore, seldom blow home, and are generally preceded by a swell from that direction; they do not come on suddenly, but back round from N.E. and North.

TIDES.—It is high water, full and change, at New Plymouth at 9h. 30m.; springs rise 12 feet, and neaps 9 feet. The flood sets to the westward, the ebb to the eastward about one knot, and much influenced by the winds. In the offing strong currents are experienced, also influenced by the winds; after south-west gales a north-east current has been experienced, the rate of which along the land was fully 1½ knots.

ROADSTEAD in North-west GALES.—In the event of a vessel being compelled to leave the roadstead by the approach of a north-west gale, and desiring to seek shelter, she may run for Massacre bay, the nearest anchorage, which affords good shelter from north-west winds.

North-west winds are generally clear, and a vessel might make the high land of Separation point without fearing Entry point and the spit off cape Farewell, by a good look-out and bearings of the land and light; it must be remembered, however, that the inner side of this long sand spit is very steep-to. (See pages 194 to 200.)

SIGNALS.—In addition to the general harbour signals (page 15), the following local night and day signals are used at New Plymouth:—

From the shore.—Two *red* lights vertical.—A boat will come off.

From the vessel.—Two white lights horizontal with one *red* over, forming a triangle.—A pilot wanted.

The two lights on the shore will appear vertical, when a vessel is in the line of anchorage, the flagstaff bearing S. ½ E., the lowest light most seaward.

" **From the shore by day.**—A ball at one yard-arm, and one on mast, half the length of yard, below the yard.—Wait till ebb tide.

" A ball at each yard-arm.—You may stand in safely.

" Two balls at each yard-arm, one below the other.—You may stand in safely, a boat will put off.

" Two balls at one yard-arm, one below the other, and one ball at the other yard-arm.—Keep to sea (to vessels approaching).

" Two balls horizontal on yard, on either side of mast.—Put to sea.

" No. 2 Marryatt's (letter J, commercial code) over the 2nd distinguishing pendant, (letter D, commercial code) at masthead.—You are running into danger.

" Signals to shipping by night will be as published in the "New Zealand harbour regulations" (page 15), but when it is intended that vessels at anchor should put to sea, two guns will be fired, in addition to showing the proper lights. If the vessel (or vessels) thus signalled can put to sea, she (or they) should repeat the proper signal (two white lights horizontal with a *red* light between), to show that the order has been understood and will be obeyed. If any vessel cannot put to sea, from whatever cause, let her show the proper reply (cannot put to sea—two white lights horizontal with a *green* light between them). Vessels approaching New Plymouth at night requiring a pilot, and wanting to come in before daylight, should fire a gun and burn blue lights, if possible, to secure attention. The ordinary signal, (wait for daylight, white over *red*), will be kept up when vessels are expected, or are seen approaching New Plymouth and Waitara.—*Harbour-master.*"

CHAPTER V.

COOK STRAIT—(*continued*).

VARIATION IN 1883.

Cape Campbell - 15° 15′ E. | Cape Farewell - 14° 45′ E.

FROM CAPE CAMPBELL TO CAPE FAREWELL, INCLUDING BLIND AND MASSACRE BAYS.

CAPE CAMPBELL is the north-east extreme of the Middle island of New Zealand, and forms the south-western entrance point to Cook strait; it bears from cape Palliser S.W. by W. ⅞ W., distant 45 miles.*

The cape is a remarkable low salient point, and should be approached with caution, especially at night and in thick weather. From the northward, two steep-peaked cliffs of a yellowish colour with a rounded summit (mount Tako) aid to point out its position; mount Tako is 674 feet high, and lies nearly 1½ miles to the south-west of the low extreme of the cape. An encircling dangerous reef of sunken rocks, with some detached and above water, extends nearly a mile N.N.E. of the cape extreme, which is sandy and low; this reef is also continuous 1½ miles to the southward on the seaward face of the cape, extending fully half a mile from the land, outside of which, and three-quarters of a mile to the north-eastward of the cape extreme, is a detached reef, Bowler reef.

LIGHT.—The light on cape Campbell is a *revolving* white light, attaining its greatest brilliancy *every minute*, elevated 155 feet above high water, and in clear weather should be seen from a distance of 19 miles. The tower, situated on a knoll at the extremity of the cape, is 73 feet high, and painted with alternate bands of red and white. Vessels from the southward bound to Wellington should take a good departure from this cape, avoiding the above-mentioned reefs, as the tides are strong in the strait.

Tides.—It is high water, full and change, at cape Campbell at 6h. 0m.; springs rise 8 feet, and neaps 6 feet.

Soundings.—The depth of water in the centre of the strait between capes Campbell and Palliser is 100 fathoms on a dark sandy bottom, the soundings decreasing gradually towards either shore. Advancing in the strait to a position midway between cape Campbell and Taourakira head, the depth increases to 250 fathoms ; this appears to be a deep hole about 5 miles in extent, and has generally a heavy tide rippling over it. It must be observed that wherever these ripplings are experienced the water is generally very deep with an irregular bottom.

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* *See* Admiralty coast charts, sheets V. and VII., Nos. 2,054 and 2,616; scale, $m=0\cdot25$ inches; also Cook Strait, No. 695; scale, $m=0\cdot5$ of an inch.

Clifford bay.—From cape Campbell to the westward for a distance of 2 miles, the coast, which is fringed with rocks, forms a bight, and affords a fair anchorage about one mile off shore in 7 or 8 fathoms, with southerly winds. At 11½ miles north-westward from cape Campbell, is White bluff, the coast of the bay between being rather low, skirted with a shingle beach ; the lake Kaipara-te-hau is 4 miles from the cape and just within the beach. Two small rivers empty themselves into the bay to the northward of it; the northernmost, Awatere river, 3 miles south-east of the White bluff, is a considerable stream, having 5 feet on its bar at high water.

White bluff is a very remarkable range of steep white-faced cliffs, their highest summit being 890 feet high, rising boldly from the sea; a mountain range extends from these cliffs to the south-west, and is the southern boundary of the Wairau plains, an extensive tract of grazing country, in the province of Marlborough.

CLOUDY BAY is the part of the coast between the White bluff and port Underwood, a distance of 12 miles; it is a deep indentation, and has a convenient depth of water for anchorage, 12 fathoms across the entrance, and 9 fathoms 1½ miles from the beach, decreasing gradually to the shore. There is good shelter at its head, with all off-shore winds from north round to south-east, and out of the strength of the tide, with the advantage of port Underwood being open in case of the wind drawing more to the eastward ; the coast line is a deep shingle beach.

Wairau river, after winding through the plain of the same name, falls into Cloudy bay, 5½ miles from the White bluff and 9 miles from port Underwood ;—as the wool trade increases this river will doubtless become of importance to the Marlborough district, for in moderate weather cargoes can be conveyed by it from the plains and shipped in Cloudy bay.

The river is navigable for cargo boats 6 miles from its mouth ; at high water there is 6 feet on the bar. A signal-staff is erected on the western entrance point, where a flag is hoisted when boats or small vessels can enter, and lowered half-mast when the bar is impassable; vessels may anchor one mile off the entrance in 5 fathoms.

" The river is navigable for vessels drawing not over 5 feet. There is a depth of 8 feet on the bar at high water. Two beacons surmounted by casks —one white, the other red,—in line, lead over the bar. The pilot attends at the entrance at tide time, and guides vessels in by waving a red flag in the direction the vessel is to steer."*

Light.—A *fixed* white light, elevated 38 feet above high water, is exhibited from the flagstaff on the western entrance point, and should be seen in clear weather from a distance of 11 miles.

Telegraph.—The shore end of the submarine telegraph cable across the strait from Lyall bay, port Nicholson, is landed in White bay, westward of Disaster point, at the northern end of Cloudy bay.

Tides.—It is high water, full and change, at Wairau river at 6h. 0m., and the stream runs in one hour after; ordinary springs rise 4 feet, but with south-easterly winds 5 or 6 feet; the greatest rate of tide at the entrance of the river is 3½ knots.

PORT UNDERWOOD is a good and spacious harbour, accessible in all weathers, and a frequent port of refuge for vessels unable to enter port Nicholson or to pass through Cook strait. It lies at the north end of Cloudy bay, and is 32 miles W. by S. ½ S. from the entrance of port Nicholson. The land in the immediate neighbourhood is mountainous, the thickly wooded peaks of mount Robertson rising over its western side to a height of 3,283 feet, and the Treble mountain adjoining it 2,930 feet.†

The harbour runs nearly north and south 5 miles, and in its upper part is divided into two arms by Separation point, a high and narrow peninsula 2 miles in length; the western arm is named Minna bay and the eastern arm Brenda bay, each forming a separate and well-sheltered harbour, their upper portion reaching within 1½ miles of the western entrance of Tory channel leading to Queen Charlotte sound;—the mountains on this dividing neck are about 2,000 feet high. The entrance is well marked from seaward; off Robertson point, its eastern entrance point, are two rocks well out of water, with straggling ones awash near them; this point should not be approached within 2 cables. A distinctly shaped saddle hill rises half a mile to the eastward of Robertson point, and the coast drops suddenly between this saddle hill and the higher land to the eastward.

A detached rock above water lies S.S.E. 2 cables from the north point of Robin Hood bay, the western entrance point of port Underwood; no other dangers exist but those just mentioned. The width of the entrance is one mile, the average depth within being 9 fathoms.

Anchorage.—Several snug bays run in from the general line of coast on either side of the port. Bells cove on the eastern shore, one mile above Robertson point, is a convenient anchorage; it is about 4 cables broad, and half a mile in depth, with 7 fathoms all over. Off its northern point, connected by a ledge, is Turner island, whose outer extreme is distant from the point 3 cables, with a reef covered with kelp extending from it more than a cable. The several bays above Bells cove also afford excellent anchorage.

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* Wellington Almanac.

† *See* Admiralty chart, Cook strait anchorages, sheet II., No. 2,685; scale, *m* = 0·9 inches.

The first cove on the western side of the port is Ocean bay, nearly abreast Robertson point; it has 4½ fathoms within the points. Two miles above it, on the west side of Minna bay, and abreast Separation point, is Oyster cove, a snug anchorage with 6 fathoms; indeed, when well inside port Underwood, a vessel cannot be at fault; there is then excellent shelter, and a choice of anchorages according to circumstances.

The coast from Robertson point trends N.E. by N. towards Tory channel and Wellington head, the latter distant from it 15 miles; the intervening shore is rugged and cliffy, and broken into small bays, with rocks extending off the points, some nearly half a mile distant, and many covered at low water.

Caution.—A vessel should not approach this coast nearer than one mile, at which distance from the shore 40 fathoms will be found 5 miles from port Underwood.

WELLINGTON HEAD is a bold and prominent headland; its sea face is a steep and rugged cliff, with a high rock standing close off it to the southward; the summit immediately over the head rises 2,190 feet above the sea.

TORY CHANNEL.—Two miles south-westward of Wellington head is the eastern entrance to Tory channel (leading to Queen Charlotte sound), its northern side being formed by Alapawa island, which separates it from the sound. This channel is frequently used with advantage by small coasting vessels and the steamers which call regularly at Picton. The entrance is narrow, being only a quarter of a mile wide, and the strength of the tide during springs attains a rate of 5 to 7 knots. Two peaked rocks extend to the south-east from the East head, and there are also some rocks above water lying a short distance off the West head.*

The channel, which is 7 miles in length to its junction with Queen Charlotte sound, maintains an average width of about half a mile, the depth being from 25 to 35 fathoms. There are several coves on either side with good anchorage in a moderate depth of water, 6 to 9 fathoms; these coves generally shoal suddenly within their points, with the bottom composed of such soft mud that a vessel might ground without feeling it, unless the lead is kept going.

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* See Admiralty chart, Cook strait anchorages, sheet II., No. 2,685; scale, $m =$ 0·9 inches.

The first cove is about three-quarters of a mile within the entrance on the north side, but is rather exposed for an anchorage; the next, nearly a mile above it, is Jackson bay, divided into two portions by the White rocks, which extend off its middle point; the northern portion is Barret bay, at the head of which was a whaling establishment. There is good anchorage in Jackson bay in 7 fathoms, but not inside the outer extreme of the White rocks.

Oyster bay on the south side, 3½ miles from the eastern entrance, is the best anchorage in the channel; vessels may anchor in 6 fathoms well within it, perfectly sheltered and out of the tide. Three bays succeed Oyster bay to the westward, Arrowsmith, Dacre, and Pelham bays; on the north side of the channel, Henderson bay is immediately opposite Arrowsmith bay.

The western entrance of Tory channel turns in a north and south direction; it is more than half a mile wide, with 30 fathoms water, and entirely free from dangers. Dieffenbach point, the western point, is a flat cliff extreme, rising gradually to a bare yellow summit, 1,200 feet high; some sunken rocks lie half a cable off it, so that it should not be approached within a cable. Heaphy point is the eastern point.

Vessels of any size may run through the Tory channel with a fair wind, by taking advantage of the proper time of tide; but it is not recommended for a large vessel to work through, the channel being so liable to squalls and baffling winds off the high land. The tides, moreover, are strong, and the water is inconveniently deep to drop an anchor, if it should be necessary.

Beacons.—Two beacons have been erected on Alapawa island, which kept in line, lead through the east entrance in mid-channel. The beacons, 21 feet high, are pyramidal in shape, and painted white.

Lights.—Two *fixed* white leading lights are exhibited from the beacons, the low light is elevated 22 feet above high water, and placed 12 yards from high-water mark; the high light is elevated 86 feet above high water, and is distant 166 yards from the low light.

These lights kept in line lead through the centre of the east entrance to Tory channel.

Directions.—Vessels crossing Cook strait from port Nicholson, should steer for the second peaked hill southward of Wellington head. On a nearer approach the land southward of the entrance of Tory channel will be easily distinguished by its chalky cliff-like appearance, gradually sloping down to the West head, which is steep and terminates in a small rocky islet 50 feet high; the land on the north side is higher and less steep.

"Steamers or handy vessels from Wellington to Picton will save time by using the Tory channel. Entering with the flood tide, keep about mid-channel. If against the ebb, keep over towards the southern shore, and thereby avoid the tide, until abreast of Boat harbour rock, which is awash and less than half a cable from the shore. After passing this rock, the full force of the tide will be felt on the port bow, unless a sweep is made so as to meet it end on. After passing the rock there are no other dangers at a greater distance than 60 feet from the shore."*

Tides.—It is high water, full and change, at the east entrance of Tory channel at 8h. 15m.; springs rise 8 feet, and neaps 6 feet.

CAPE KOAMOROO, the south-east entrance point of Queen Charlotte sound, bears N. ¾ W. 6½ miles from Wellington head; it is the north extreme of Alapawa island, which separates that sound from Tory channel; between these two headlands the coast is nearly straight, very steep, and iron-bound. About midway it is nearly divided by the waters of East bay, which indent the western side of the island, and in some places is a mere knife-edged ridge of barely sufficient width to walk on.

Dangers off coast.—Off this part of the coast lie the principal dangers in Cook strait, namely,—two rocks awash north-eastward of Wellington head; the Brothers islands, with their reefs; and Cook rock.

Awash rocks.—The first of these dangers, the two rocks awash, occupy a space of one-third of a mile, in a north and south direction; the southern rock is nearly awash at high water, and the northern rock dries 6 feet at low water; they lie N.E. by N. from Wellington head, distant 3½ miles, and are 2½ miles from the nearest part of the coast, with 48 fathoms in mid-channel between. The Brothers' light N.N.W. clears them three-quarters of a mile to the eastward.

BROTHERS ISLANDS are two small islands, about the same size, each nearly one-third of a mile in length, and about 235 feet high; they lie half a mile apart in a N. by E. and S. by W. direction, the southern bears from Wellington head N. by E. ¼ E., distant 5 miles; the northern islet, East 2½ miles from cape Koamoroo.

There is no passage between these islands; several rocks and reefs are scattered about them, and the tides are very strong with heavy ripplings. A rock with 3 feet on it at low water lies W. by S. ½ S. from the centre of the South island a long half mile, which narrows the passage between the Brothers and the land of cape Koamoroo to 1½ miles; although there is deep water (56 fathoms), this passage is not recommended, and certainly vessels should never take it without a fair wind; the Brothers islands should not be approached within one mile by a stranger.

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* Wellington Almanac.

LIGHT.—On the northern Brother stands a wooden lighthouse 28 feet high, painted white, and exhibits at an elevation of 258 feet above the sea, a white light *flashing* every 10 seconds, which should be visible in clear weather from a distance of 22 miles.

From the lower part of the tower, a fixed *red* light is shown in the direction of Cook rock, over an arc of 5°.*

COOK ROCK is highly dangerous, as it is only awash at low-water springs, and is in the track of vessels passing through Cook strait from the westward, and also of those entering Queen Charlotte sound. It lies N.N.W. ¼ W. 3¾ miles from the Brothers lighthouse, the *red* ray from which marks the rock, and should not be entered when in its vicinity; N. by E. ½ E. from cape Koamoroo, 3¼ miles; and from cape Jackson, the northern entrance point of the sound, E. by S. ⅜ S., distant 5⅔ miles. There is generally a tide rippling on and about Cook rock, and in strong winds it will be seen to break before low water—when visible it resembles a whale's back.

Clearing marks.—To clear Cook rock vessels entering Cook strait from the westward and bound through, or to port Nicholson, should, when abreast of Stephens island, at a distance of about 3½ miles from it, steer S.E. by E. for 30 miles, or until the Brothers are in line with Wellington head bearing S. by W. ¼ W., or at night when the light is westward of that bearing; the extreme of cape Terawiti will then bear S.E. by S., and Cook rock will be westward of the line of White rocks and the north end of Long island, (in the entrance of Queen Charlotte sound,) bearing S.W. ½ W. distant 4 miles; a course may then be steered S.S.E. to clear cape Terawiti.

Vessels from any of the anchorages between D'Urville island and Queen Charlotte sound, after passing cape Jackson, should not bring that cape to bear to the northward of West, or should not steer to the southward of the north end of Mana island, (Alligator head in line with cape Jackson is a good mark,) until cape Terawiti bears S.E. by S., which will lead 2 miles northward of Cook rock. The west end of the White rocks (Queen Charlotte sound) in a line with the north end of Long island bearing S.W. ½ S., leads directly on Cook rock.

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* Commander Drury is of opinion that Stephens island and cape Terawiti would be good sites for lighting Cook strait.

QUEEN CHARLOTTE SOUND.—The entrance to this sound lies between capes Koamoroo and Jackson, distant from each other little more than 6 miles in a north-west and south-east direction.*

Cape Koamoroo is the southern head; it has a cone-shaped hummock on its extreme, and immediately inside it a higher hill 936 feet above the sea; it will also be known by its proximity to the Brothers islands.

Stella rock is a sunken danger lying about a quarter of a mile from the extremity of the reef on the western side of cape Koamoroo, it is nearly a cable in extent north and south, with a depth of 6 feet at low-water spring tides, and from 10 to 13 fathoms around; it lies with the White rocks bearing N.W. ½ W., and cape Koamoroo E. by N. ¼ N.

The south extreme of Long island just open of the westernmost Twin, leads 1½ cables north-westward of the rock.

Cape Jackson, the northern entrance point, is a long narrow elbow-shaped point, the extreme of a peninsula which separates the sound from port Gore, to the westward; it is remarkable from its shape, being flat towards the extreme, where it is 280 feet high, and rising at the elbow to 740 feet. Two flat black rocks lie off its outer extreme, the outer (Walker rock) is one mile N.E. by N. from it, and 3 feet above high water; there are always tide ripplings off these rocks, and the tides set across the entrance of the sound with considerable strength on both points.

Caution.—Vessels should avoid the boat passage north of cape Jackson. According to a recent examination the depths are variable; 4 fathoms was the least water found, but it is stated that a vessel drawing 14 feet lately grounded in the passage.

Directions.—Vessels entering Queen Charlotte sound from the eastward, may pass either side of Cook rock as convenient; if to the southward of it there is a clear width of more than 3 miles, and vessels from the southward would generally take that channel. Passing outside the Brothers at not less than one mile, cape Koamoroo, which has no sunken dangers off it but the Stella rock, may be rounded at a convenient distance, and the White rocks and Long island passed on either side according to circumstances.

Entering the Sound from the northward or westward, there is a clear channel of 5 miles between Cook rock and cape Jackson, and the only directions which seem necessary are, not to stand so far to the eastward as to bring the White rocks on with the north end of Long island;

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* *See* Admiralty chart, Cook strait anchorages, sheet II., No. 2,685; scale, m = 0·9 in.

while these rocks are kept open to the eastward of the island, a vessel will be to the westward of Cook rock. When Alligator head and cape Lambert are open to the northward of cape Jackson, a vessel will be 2 miles to the northward of the rock.

The White rocks, Motuara and Long island, lie in the entrance of the sound; the former are a ridge of peaked rocks a quarter of a mile in extent, 60 feet above high water, and bearing W. by N. ½ N., one mile from cape Koamoroo, with a passage on either side of them. The two islands lie 3½ miles within the line of the entrance capes, Motuara on the western, and Long island on the eastern side; there are also passages between and on either side of them.

The sound runs in a S.S.W. direction 14 miles to the western entrance of Tory channel, and then S.W. by W. ½ W. for 11 miles to its head; its drawback as an anchorage is the inconvenient depth of water, which generally varies from 20 to 25 fathoms. It is indented on either side with numerous bays, particularly on the north side, where there are no less than ten in number above Ship cove; all these bays afford secure anchorage, but the least depth of water to be found in them is 16 fathoms unless at the head of the sound.

This great inlet is singularly free from dangers, for, with the exception of a shoal patch north of Motuara, a sunken rock (Luke rock) off the eastern point of Fly bay, marked by a black buoy, Sunk rock off Separation inlet, and Hawes rock with 10 feet water, marked by a red buoy, half a mile south-west of Pig island, there are no impediments to navigation. The land is high and generally thickly wooded to the water's edge, rising on the north side to an elevation of from 1,500 to 2,000 feet: on the south side are mounts Robertson and Treble already mentioned, page 169.

Ship cove.—At the entrance of Queen Charlotte sound on the western side, abreast Motuara island, are three coves, the southern of which is the Ship cove of Cook; this anchorage has the advantage of a more convenient depth of water than is to be found in any other part of the sound, though it is less sheltered than the bays further within, and is more subject to heavy squalls and variable flaws of wind during bad weather, from the high land which rises immediately over it, vessels are in consequence liable to foul their anchors and drag, unless moored. The shores of the cove are rocky, and so steep that a vessel would almost bring up against the cliffs before she grounded.

Anchorage.—The anchorage bears West from the south end of Motuara island, with a general depth of 10 fathoms in the cove; towards the island it is not so deep, being from 7 to 8 fathoms.

A rocky patch of 12 feet extends northward from the north end of Motuara, which has a 6-feet rock at its extreme, distant half a mile from Motuara, and is marked by kelp. Vessels, therefore, entering Ship cove from the northward, and passing between the north end of Motuara and the western shore, should keep the latter on board; the width of this channel is half a mile.

The passage between Motuara and Long islands is three-quarters of a mile wide in its narrowest point, and the least depth of water 7 fathoms.

Long island lies in the direction of the sound, and is 2¼ miles in length by half a mile in breadth; its western side is steep and cliffy, and detached rocks lie off its north end, as also a rock which shows at low water, 2 cables N.N.E. of them.* The passage between Long island and the eastern shore is three-quarters of a mile in width, with 20 fathoms water.

The Twins rocks, high out of water, are three-quarters of a mile eastward of the north extreme of Long island, and Cooper island is a quarter of a mile S.S.E. of the Twins.

East bay, on the western side of Alapawa or Carlyle island, is an extensive inlet 4 miles deep and 1½ miles wide, being separated from the sea by a steep and narrow ridge, before alluded to; its entrance is one mile south-eastward of the south point of Long island, and 5½ miles south-westward of cape Koamoroo; there are 25 fathoms water all over it. Off its southern entrance point, is a cliffy island nearly one mile in extent called Pickersgill island.

Pig island 1¾ miles S. by E. ¼ E. of Long island, is more than 2 miles long in a north and south direction, and 1¼ miles east and west; it is 1,023 feet high, and has two bays on its western side. There is a narrow channel (Patten passage) between it and the south shore, with 24 fathoms water, but that to the westward is the fair channel up the sound.

Hawes rock.—This is a rock with 10 feet water over it, lying half a mile off the south-west end of Pig island, marked by a red buoy on its west side.

WESTERN SHORES OF SOUND.—Returning to the western entrance of Queen Charlotte sound; the hill immediately over the south side of Ship cove has a bare yellow looking summit 1,353 feet high, and south of it Resolution bay runs in for a mile, being about the same width at its entrance, and with 27 fathoms water in it. The adjoining bay, one mile to the southward, and the most considerable in extent on the north side of the sound, is Endeavour inlet; it runs to the northward for 4 miles, with two arms, the easternmost reaching within a short distance of Cockle bay in port Gore, and making a peninsula of the land which forms the western entrance of the sound; the depth of water in Endeavour inlet is 25 fathoms.

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* H.M.S. *Challenger* in July, 1874, anchored in Queen Charlotte sound, between Long island and Motuara island, in 7 fathoms, with Twin rocks in line with northernmost Long island E. ½ S. half a mile distant; this was found to be an excellent anchorage with south-east gales, the wind being far more moderate, and the ship lying easier at her anchor than at port Hardy during the same sort of weather.—Remarks by Navigating Lieutenant T. H. Tizard, R.N.

Many Coves bay is the next, a spacious and desirable anchorage; above it is Fly bay, off the eastern entrance point of which, S.W. ¾ S., nearly one-third of a mile, is Luke rock, with 3 feet on it at low water, which is marked by a black buoy.

The average width of the main arm of the sound above Fly bay is nearly one mile, and the bays and coves are so similar in features that it will be unnecessary to offer any particular description. The westernmost bay on the north side, Separation inlet, runs nearly 2 miles to the northward with a double head, and is only separated from an arm of Pelorus sound by a neck of land one-third of a mile across; the depth of water in this bay is from 9 to 13 fathoms. Sunk rock lies a cable S.E. by S. from its western cliffy entrance point.

The head of Queen Charlotte sound extends 3 miles above Separation inlet, and maintains an average width of little more than half a mile, with from 14 to 15 fathoms, terminating in a curvilinear sandy and shingle head, which dries for a quarter of a mile off shore, and is shoal for nearly double that distance.

Waitohi bay, the westernmost bay on the south side, is a double bay with a small islet lying off the middle head; there is anchorage in 6 and 9 fathoms near the head of the eastern arm. The town of Picton now stands at the head of the bay on the spot that was occupied by the native village of Waitohi.*

Picton is the principal port for the Marlborough district, and is connected with Blenheim—the chief town—by rail. It is one of the ports of call of the intercolonial steamers. The population in 1878 was about 3,000.

Light.—The fixed *red* light exhibited from the end of the wharf at Picton, which has 15 feet water, with good accommodation for shipping, is elevated 20 feet above high water, and should be seen in clear weather from a distance of 6 miles. On entering, as soon as the light opens, steer for it.

The east point of Waitohi bay is a remarkable sharp point called the

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* The land here was purchased from the natives, and the site of a township marked out, as it was in contemplation to cut a road to the Wairau plains, 12 miles distant; an indifferent path in 1864 connected the two, but the project of the road for the conveyance of the produce of the plain for shipment to Queen Charlotte sound, was abandoned.

Snout, with four round hills very similar in appearance rising over it. In the centre of the main arm of the sound, three-quarters of a mile from the Snout, is the small round island Negara, 300 feet high, with an islet close off its eastern side.

There are two bays and a deep narrow creek between Waitohi and point Dieffenbach, the western entrance point of Tory channel, a distance of 6 miles.

Tides.—It is high water, full and change, at the entrance of Queen Charlotte sound at 8h. 50m. The general rise of the tide is from 6 to 8 feet at springs: the ebb or southerly stream commences at 9h. 40m., and the flood or northerly at 3h. 40m. The flood tide entering the sound by Tory channel, flows outwards towards Long island, until it meets the regular stream of flood; the strength between Motuara and Long island is from half to 1½ knots. In the sound above the western entrance of Tory channel there is not much tide; at the head it is high water at 9h. 25m.

Caution.—During strong winds in Cook strait, Queen Charlotte sound is liable to heavy gusts off the high land and out of the mountain gullies, which give little or no warning, and it is necessary to use caution, especially with boats under sail.

Water.—There is no difficulty in obtaining fresh water, as streams exist in every creek, and wood may be had in abundance in every part of the sound.

Note.—The name of Admiralty bay has been indiscriminately assigned in the old charts to the numerous harbours and anchorages between Queen Charlotte sound and cape Stephens, D'Urville island. To prevent confusion, that name will be more definitely confined to the space between D'Urville island and the peninsula which forms the western entrance of Pelorus sound.

PORT GORE (*Ana-mahanga*) is an extensive inlet immediately westward of Queen Charlotte sound; it lies between capes Jackson and Lambert, which are 3½ miles apart, bearing nearly east and west, and extends in a south-westerly direction 6 miles, meeting within 1½ miles of Endeavour inlet, Queen Charlotte sound.*

The general depth of the water in port Gore is rather inconvenient for anchorage, being from 16 to 20 fathoms. Two miles within the entrance a bank extends across with from 9 to 12 fathoms on it; and on the eastern side, 3½ miles above cape Jackson, there is anchorage in 11 fathoms half a mile off shore. There are two coves at the head of the port; Cockle bay, in the south-east corner, has good shelter and holding ground in 15 fathoms;

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* *See* Admiralty chart, Cook strait anchorages, sheet II., No. 2,685; scale, $m = 0 \cdot 9$ inches.

and Melville cove, on the western side, has anchorage in 12 fathoms, 2 cables from its head, and is preferable to the former.

The land is high over the head of port Gore, and thickly wooded; in the centre of the peninsula, less than one mile from the head of Cockle bay, mount Furneaux rises to a height of 2,692 feet; mount Stokes the highest in the neighbourhood, 4 miles south-westward of the head of the port, attains an elevation of 3,900 feet; and the Puzzle peaks, less than a mile north-westward of Melville cove, reach a height of 3,330 feet.

Waitui bay, the next bay westward, lies between cape Lambert and Alligator head; it is 3 miles wide at the entrance, and about 2 miles in depth; the shores around are steep and cliffy, and it is not a place of shelter.

Guards bay lies to the westward of Waitui bay, between Alligator head and Forsyth island; and with its inlets Titirangi and Akaloa affords shelter from all winds. The small island Motu-ngara lies in the entrance one mile N.W. of Alligator head, with a reef awash at half-ebb extending one-third of a mile eastward of its eastern end; there is a deep water channel between this reef and Alligator head, as also a broad and clear channel between Motu-ngara and Forsyth island.

Forsyth island, which forms the western side of Guards bay, is 3¼ miles long, in a north and south direction, and separated from the mainland by a very narrow channel with 7 fathoms water in it.

The entrance of Guards bay is 3½ miles wide, with 20 fathoms between the heads, but immediately within a bank stretches across, with 8 and 9 fathoms water on it. Two miles above the heads, the bay is divided into two arms by a projecting cliffy point; the eastern arm, Titirangi bay, runs to the south-east nearly 2 miles, and the western, Akaloa (*Castlewood*) bay, extends in the same direction for 3 miles; both have an average width of one mile, with good anchorage in from 10 to 14 fathoms muddy bottom.

There is also anchorage on the western side of the bank just noticed under Forsyth island in 8 and 9 fathoms; and with south-east winds on the southern edge of it, off the eastern point of Titirangi bay in 9 fathoms. Mount Stokes is nearly 3 miles distant from the head of Akaloa bay.

PELORUS SOUND.—This great inlet, which lies between Guards bay and Admiralty bay, is similar in character to Queen Charlotte sound; it extends in a southerly direction about 25 miles, branching off to the eastward and westward into numerous arms and creeks, and embracing no less an extent of coast line than 250 miles. Its entrance on either side is formed by a peninsula, the western being almost isolated by the head of

Croisilles harbour, the isthmus which divides their waters being only half a mile across; and the eastern by a narrow neck 100 feet broad, which separates it from the bight westward of Forsyth island, while an arm at the south-eastern head meets within less than half a mile of Separation inlet at the head of Queen Charlotte sound.*

General Character of the Country.—Except at the head of the main branch, the general character of the country is mountainous, rising with almost perpendicular acclivity to heights of from 2,000 to 3,000 feet, and clothed with dense forests. The shores of the intervening bays receiving the mountain streams, are equally impenetrable, as the sides of the ravines are steep and rugged; and with the exception of the site of an old settlement (Kopai) in one of the arms, there are few acres in any one spot that could be brought under cultivation. In proof of this the natives seem never to have had any settlement but the one mentioned, and it is deserted they say, because the ground is cursed. The soil, however, everywhere accords with the luxuriant mountain vegetation, being generally of the richest loam, and of considerable depth; the geological feature of all the points and banks of the river is soft clay-slate, with frequent veins of quartz an inch thick; the whole country abounds in it, blocks being found on the hills, and the beach is strewed with quartz pebbles.

ENTRANCE.—The north-west end of Forsyth island forms the eastern outer entrance point, and Harding point the western, being little more than 2½ miles apart.

Chetwode islands lie immediately off the mouth of the sound, distant nearly 2 miles from either entrance point; they are two narrow islands, 3 miles long, lying in a north-east and south-west direction, connected by a reef, and have rather remarkable hills, with sharp peaked summits 730 and 840 feet high. A reef of rocks above water extends half a mile N.N.E. of the easternmost island, and the Sentinel rock, 65 feet above the sea, lies E.N.E. 1½ miles from the north-east end of the same island; there are also heavy tide ripplings about these islands.†

Vessels may enter Pelorus sound on either side of Chetwode islands.

A rock high out of water lies in the eastern passage, half a mile from the south-east side of the larger or south-west island. There is also a sunken danger, Pelorus rock, about three-quarters of a mile from the south end of the Chetwode islands, and the same distance S.W. from the rock out of water; this rock has 5 feet water on it at low-water springs, and may be easily avoided by keeping closer to Forsyth island, in passing through this, the eastern, passage.*

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* *See* Admiralty chart, Cook strait anchorages, sheet II., No. 2,685; scale, $m = 0 \cdot 9$ inches; also Cook strait, No. 695; scale $m = 0 \cdot 5$ inches.

† *See* Admiralty chart, Cook strait anchorages, sheet I., No. 2,684; scale, $m = 0 \cdot 9$ inches.

Oke rock, which covers at half-tide, lies in the Kakaho channel, the passage between the Chetwode islands and west Entry point, not more than 3 cables from the western shore, with 25 fathoms round it.

Beacon.—A small iron beacon surmounted by a ball, and painted red, has been placed on Oke rock, that shows 8½ feet above the level of high water springs: the beacon is a single iron bar stayed with chains. Should the beacon not be seen this rock may be avoided on entering Pelorus sound, through the Kakaho channel, by keeping the reef, extending from the north-west end of Forsyth island, on the starboard bow until west Entry point is open, which clears it.

Soundings.—The depth of water in Pelorus sound varies from 45 to 16 fathoms, gradually decreasing in the main branch towards its head where it receives two rivers forming shoal banks at the head of that arm. With this exception, Oke rock just noticed, and Kainoki, a sunken rock off the entrance of Waihinau bay, the second bay on the western side, there is no obstruction to navigation; and the sound has this peculiarity, that the nearer the points are approached, the deeper is the water.

BAYS AND ANCHORAGES.—The following is the order in which the bays and anchorages in this sound will be found:—beginning at the east Entry point, the first bay is Ketu, one mile within, with 30 fathoms across its entrance; at the head of this bay is Snug cove, having 10 fathoms. Richmond bay (*Kopaua*) is immediately beyond, a bight 1½ miles deep: here again the anchorage is at the head in 14 fathoms, the neighbouring mountains rising 1,980 feet. There is another sheltered bay before reaching Takaka point, which is immediately opposite Orieri island, the channel between being one mile in breadth, with a depth of 40 fathoms. Here the main branch of Pelorus sound bends to the eastward, while another considerable arm, Tawhiti-nui reach, stretches 9 miles to the south-west, containing three islands, and one of its bays meeting within a short distance of Croisilles harbour.

Opposite Tewero, a bare point 2 miles E.S.E. of Orieri island, and at 1½ miles east of Takaka point, is Kauauroa bay, a good anchorage, 1½ miles eastward of which is Whakamawahi, an extensive arm of the sound having three branches. Hikuraki, the northern, is separated from the head of an outer bight (Forsyth bay) by a narrow neck only 100 feet across, and also about the same height; the middle, Mamiaro, having land remarkably bare for Pelorus sound; and the third, Karepo, which runs southward about 4 miles, on whose eastern shore is the deserted village, Kopai (before mentioned); it has excellent anchorage, and is the only part of these sounds having a tract of land adapted to cultivation, consisting of from 200 to 300 acres.

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* "Canterbury rock—a dangerous rock, lying in the track of vessels passing through French pass northward of the Chetwode islands, and of those entering Pelorus sound westward of the Chetwodes—lies about 2 miles off the latter, and about 4½ miles from the mainland at the entrance to the Sound, with part of Ketu bay open.—Wellington Almanac."

Captain McGillivray states "that a patch with 4 fathoms on it lies westward of the position assigned to Canterbury rock, towards D'Urville island."

S.S.W. from Tewero point, the next reach for 7 miles is Popoure, having bays on either side: Pokokini bay on the east; the Tamuakaiwawi, Piaukahe, and Opouri bays on the west: the western bays have the best anchorage; the channel of this reach has 27 fathoms mud.

The next reach, Pinohia or Hikapu, running southward for 5 miles, is less indented; the head of this reach was the anchorage of H.M. ships *Fantome* and *Pandora* in 1854; these vessels, the merchant ship *Tory*, and H.M.S. *Pelorus*, in 1830, are the only vessels of any size which had up to 1854 navigated the sound. At this anchorage ready communication can be had with the natives; their cultivations and small fishing stations are to be seen on the banks; the villages are 5 miles distant.

Eastward of Pinohia is the long arm of Toreamounu or Kipuru (Kenepuru) sound, extending 11½ miles N.E. by E. ½ E. having a depth of not more than 14 fathoms gradually decreasing towards the head, and with an average width of three-quarters of a mile.

At 7 miles within the entrance of this arm on the south shore, a boat channel was cut (1882) through Gully's neck, in which the depth at ordinary high water is 5 feet.

Mahau sound, 3 miles in length, is southward of Toreamounu, and divided from it by a narrow ridge Putahuia; at its head there is a level plain, one mile long, and 1½ miles in breadth, extending to Toreamounu arm; Ohingoroa and Moi-tapu bays, on the south side of Mahau sound, have cultivated land at one mile southward of the anchorage.

Mahakipawa arm, 3 miles above Mahau sound, is very shoal; its head is within an hour's walk of the head of Queen Charlotte sound. Mahakipawa is rather a large native settlement, where provisions may be obtained; two small vessels traded between it and Nelson in 1854, wheat and potatoes were the principal produce. Near its western entrance point the rivers Hoiere and Kaituna meet, forming banks, and leaving channels only navigable for small boats. The town of Havelock is situated here.

Tawhiti-nui reach.—Returning to the entrance of the sound, we left Tawhiti-nui reach extending on the western side, abreast Orieri island, for 9 miles to the south-west; this arm differs from all other parts of the sound by having in it Orieri island, as also the three smaller islets, Tawhiti-nui, Awaiti, and Oaie; the latter situated in that part of the reach, where Croisilles harbour is separated by an easy half hour's walk over a hill of 560 feet elevation.

Kawai sound forms the southern head of Tawhiti-nui reach; the four bays at its head are all of the same character, backed by mountains from 2,000 to 2,700 feet high.

Apua channel, westward of Orieri island, is half a mile wide, with 29 fathoms in it; there is a double bay to the westward (Fitzroy bay), which is nearly 4 miles from the French pass, but the dividing range is very high and precipitous.

Proceeding outward from Orieri island along the west coast of the sound, we come to Waitata bay, perfectly clear, with 14 fathoms throughout; the entrance points are, Kaiaua, a yellow point, and Moitera, having a white rock off it resembling a boat under sail.

Rock.—Waihinau, the next bay, is considered a good anchorage by the natives, the squalls of wind not being so heavy as those on either side. A dangerous rock (*Kainoki*) at the mouth of this bay, is awash at low water; from it Danger point (the north point of the bay), bears N.N.W. ½ W. half a mile; and west Entry point, N.E. by E. 1¼ miles.

Port Ligar,[*] immediately within west Entry point, is a fine harbour, and equal to any in Cook strait; the outer portion (*Kopi*) has from 14 to 17 fathoms water; the northern shores are separated by a narrow neck, one-third of a mile wide, from Admiralty bay. The north entrance point of port Ligar is a long yellow clay point tapering to the water.

From west Entry point the coast trends northward 2½ miles to Harding point, opposite Chetwode islands, and thence westerly to Admiralty bay.

In Pelorus sound there are at least thirty bays or anchorages, mostly landlocked, and safe in any winds; the gusts in bad weather are very furious.

Water and fish.—Fresh water may always be obtained; fish in abundance may be caught off the points.

Tides, winds, &c.—It is high water, full and change, at the entrance of Pelorus sound at 9h. 35m.; springs rise 11 feet, and neaps 7 feet; the tides in the stream run 3 knots, but they are scarcely felt at the anchorages. The prevailing winds blow down the reaches from seaward, but south-east winds, lasting 48 hours, accompanied by heavy rains and violent gusts, are not uncommon.[†]

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[*] Named after the Surveyor-General of New Zealand (1854).

[†] Until the survey by H.M.S. *Pandora*, in 1854, it was considered that Pelorus sound would offer facilities for shipment of produce of the Wairau plains, but after an examination of the Kaituna pass (the projected route) by the officers of that ship, many difficulties were found to exist in making a suitable road to the plains; moreover, the banks at the head of the sound would prevent a vessel of burthen approaching the

ADMIRALTY BAY lies between D'Urville island and the peninsula which forms the western entrance of Pelorus sound. It runs in a south-westerly direction for 7 miles, and is 4 miles wide at the entrance, off which are the Trio islands; and 4 miles N. by E. ½ E. of the latter are the Jag rocks.*

Trio islands.—The centre and largest is of triangular shape, and half a mile in length; the other two are small, and lie half a mile to the northward and southward of the centre islet, and connected with it by shoal water.

Jag rocks, a cluster covering the space of half a mile in a north and south direction, are 40 feet high. They lie 3 miles eastward of Rangitoto islands, and bear S.E. ½ S., 6½ miles from the centre of Stephens island.

D'URVILLE ISLAND is a prominent feature in Cook strait, projecting as a bold and salient point into it from the eastern shores of Blind bay. It is 17 miles in length north and south, and 5 to 6 miles east and west, and separated from the mainland by a very narrow channel (the French pass). The island is mountainous and wooded, the highest part (mount Woore) attaining an elevation of 2,180 feet. Entering Cook strait from the westward, D'Urville island is generally the first land made, and in clear weather its mountains are easily distinguished at the distance of 40 miles.

STEPHENS ISLAND, which lies 2 miles north-eastward of the northern extreme of D'Urville island, is a scarcely less prominent object, though only a mile in extent; it rises abruptly from the sea to a height of 950 feet. The passage between these islands is not recommended, though coasters acquainted with the dangers sometimes avail themselves of the channel.

The harbours of D'Urville island are, port Hardy and Greville harbour; there is also the roadstead of Rangitoto on the eastern coast, formed by three islands of the same name which lie off it.

Rangitoto roadstead is a convenient anchorage with westerly winds ranging from north to south; it is on the eastern side of D'Urville island, 4 miles from cape Stephens, the northern extreme. The anchorage is in the southern bight of the bay, about one-third of a mile off shore,

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Kaituna pass nearer than six miles, and during the ordinary winds it would take a sailing vessel three days to work out, with the inconvenience of having to anchor in deep water every tide; under these circumstances, Commander Drury was of opinion, that Pelorus sound is not to be preferred to port Underwood or Cloudy bay.

* *See* Admiralty chart, Cook strait anchorages, sheet I., No. 2,684; scale, $m = 0 \cdot 9$ in.

the water is rather deep, there being from 12 to 14 fathoms close in shore. A remarkable double-peaked mountain, the Ears, 1,525 feet high, rises a short mile to the south-westward.

The best approach to the anchorage is southward of Rangitoto islands, lying half a mile off shore, and extending 2½ miles in a north and south direction, having only boat channels between.

Tides.—It is high water, full and change, in Rangitoto road at 8h. 10m., rise 6 to 8 feet. The tide sets between Rangitoto and D'Urville islands at the rate of one to 3 knots, the flood running to the northward, ebb to the southward; but at the anchorage, which is W.S.W. one mile from the south end of the southern island, a vessel will be nearly out of its influence.

PORT HARDY, at the northern end of D'Urville island, lies between cape Stephens and Nile head, the latter forming its western entrance point; these headlands bear N.E. and S.W. from each other, distant 4 miles. Several rocks, high above water, extend half a mile north-west of cape Stephens.*

Vessels making for the port from the eastward should pass to the northward of Stephens island, as there are two clusters of rocks in the passage between it and D'Urville island, the Saddle and Tower rocks, and the tides are very strong.

Breakers.—Between Stephens island and Saddle rocks breakers were observed from H.M.S. *Sappho* in 1877, at apparently about 4 cables S.W. ¼ S. from the south-west extreme of Stephens island.

Nelson's monument and Victory islet are in the entrance of port Hardy, the former a high rock lying one mile to the eastward of Nile head; the latter a small island eastward of and the same distance from the Monument, with the Fleet (a cluster of rocks) extending southward from it to the eastern shore.

The passage into the port is on either side of Nelson's monument, in deep water; the widest channel is between it and Victory island, as a reef extends 1¼ cables off both Nile and Trafalgar heads,—the outer and inner western entrance points,—which narrows the channel on that side.

The tides set directly across the entrance of port Hardy, the flood setting to the westward and the ebb to the eastward; due allowance must be made for this in entering. In bad weather a confused sea gets up here, which renders port Hardy less desirable as a harbour of refuge for a sailing vessel during a gale, than the adjacent ports eastward and westward.

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* *See* Admiralty chart, Cook strait anchorages, sheet I., No. 2,684; scale, $m = 0 \cdot 9$ ins.

Inside Nelson's monument, the port runs S. by W. 2¼ miles, with an average width of three-quarters of a mile, when one arm takes an easterly direction, and the main branch continues its southerly trend, both extending for about 2 miles, with anchorage in 14 fathoms; no less depth than this will be found in any part of the port.

Water.—Fresh water may be always procured from the streams in any of the coves.

Tides.—It is high water, full and change, at port Hardy at 9h. 55m.; springs rise 12 feet. Off Stephens island the flood or north-westerly stream begins at 5h. 15m., and the ebb or south-easterly at 11h. 15m.

Greville or Brooke harbour is on the western side of D'Urville island, 6½ miles southward of Nile head. Mount Woore, the highest land of the island, 2,180 feet high, rises over its northern shore; the entrance points lie north and south of each other, one mile apart, and a rock 4 feet out of water lies a quarter of a mile N.W. of the south entrance point (Ragged point).

The harbour runs S.S.E. for 1½ miles, with a width of nearly one mile, the depth from 7 to 10 fathoms; an arm then runs to the eastward for the same distance, with from 7 to 15 fathoms, which is nearly closed by two boulder spits projecting from either shore at the entrance; for large vessels there is no protection from north-west gales. From this harbour, the coast of D'Urville island trends S. by E. 6½ miles to its south-west extreme, Sauvage point.

CURRENT BASIN and FRENCH PASS.—The entrance lies between Sauvage point and Hole in the Rock point on the mainland. Lebrun peninsula, a short distance within Sauvage point, extending—with the rocks off it—more than half a mile to the southward, leaves the width of the entrance about a mile, with nearly in the centre Piège rocks, three rocks which just cover at high water, bearing from Sauvage point S. ½ E. 9 cables.*

The Chicots, three larger rocks, the highest about 15 feet above water, covering a space of 2 cables, lie W. ½ S. nearly 1¼ miles from the same point, with a reef nearly a mile to the north-eastward, between them and the shore of D'Urville island.

Rock awash.—Another danger discovered by H.M.S. *Pandora* also exists; it is a rock about 50 yards in extent, between the Chicots and Sauvage point, bearing from the largest of the former E. by N. ½ N. 7 cables, and from the latter W. by N. ¼ N. 5½ cables, and is just without the line from the high water extreme of Lebrun peninsula and Sauvage point; this rock is steep-to, with a depth of 11 fathoms between it and D'Urville island, and 12 fathoms towards the Chicots. As it is only visible at low water, vessels passing between the Chicot rocks and D'Urville island must be careful to avoid it.

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* *See* Admiralty plan, Current basin and French pass, No. 1,096; scale, $m = 2 \cdot 8$ in.

There is a deep water channel on either side of the Piège rocks;—Current basin then runs north-eastward 3 miles to French pass, with a width of one mile, and a general depth of from 15 to 20 fathoms, rocky and gravel bottom.

FRENCH PASS is the narrow strait between the southern part of D'Urville island and the mainland, affording communication between Admiralty and Blind bays. Its narrowest part, between Reef point on the north and Channel point on the south, is 540 yards across at high water; but a reef of rocks extending from Reef point in a S. by E. direction about 400 yards, leaves only a clear and straight channel of 117 yards between their extreme and the low-water mark on the south shore, both being perfectly steep-to. The extreme of the rocks, which are only uncovered at low springs, is marked by an iron perch, so that vessels passing through at any time of tide can see exactly the breadth of the channel, and may pass as close as 10 yards to the perch if necessary.

Rock Cod point, 2 cables to the southward of Channel point, has sunken rocks extending S. by E. 100 yards from it, for which due allowance must be made, as the tides are stronger there than in the pass. There is also an awkward shell bank—the Middle bank—with 8 feet at low water before reaching the pass, from the Current basin side; it is 3 cables long in a north-east and south-west direction, and one cable in width, and its northern extreme is only 2 cables from the perch on the reef.

Buoy.—A red buoy in 3 fathoms at low water, marks the north-eastern edge of the Middle bank, rendering the navigation of the channel much easier. The distance from the north-eastern edge of the bank to Rock Cod point is 1½ cables, it follows that the seaman must judge his distance should the buoy, from any cause, be removed, for the points being so much alike, and the tide so rapid, natural leading marks would be likely to lead into error.

On the western side of the pass there is a 3-fathom rocky patch 1½ cables N.E. from Reef point, but it is not in the track of vessels passing through.

"A patch about 100 yards in extent with 8 fathoms mud, lies about in a line between point Collinet and Reef point, off the north-east entrance to the pass, a little westward of the fairway and about the place where

53 fathoms is marked on the chart; it forms an excellent anchoring ground for vessels waiting for the tide."*

TIDES.—The tides, instead of setting directly through the narrow channel, set across more in a line from Rock Cod point to Channel point, and the contrary, and a tidal irregularity which though not of rare occurrence is especially remarkable in this pass, viz., that the ebb stream running to the eastward commences at 2 hours before actual high water by the shore, the tide at the same time rising in Current basin and the French pass; the extraordinary nature of the bottom, in connection with the narrowness of the channel, is quite sufficient to account for the whirling of the current, the depth varying from 7 to 53 fathoms, without reference to the distance from the shore or rocks.†

BLIND BAY.—FROM D'URVILLE ISLAND TO MOTUEKA RIVER.

BLIND BAY is an extensive opening, the width from D'Urville island to Separation point, its north-western extreme, being 36 miles, and its depth within these limits 28 miles.‡

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* Capt. McGillivray.

† In offering an opinion on the French pass as an available channel for shipping, it may be observed that it is perfectly straight, and sufficiently broad and deep for the largest ships, being twice the width of the entrance to Nelson haven, and its narrowest part is passed in a few seconds. No sea can get up, and anchorage can be found on either side, but not in the pass. On the other hand, the chances of hitting the correct time of tide, the possibility of having to anchor, and of the wind failing, and the consequent risk of being carried on the rocks by the current, are disadvantages which the saving of 12 or 15 miles do not compensate for, or warrant the risk; it cannot, therefore, be recommended for large vessels; but by coasters it may be, and often is, used with advantage, anchoring in Current basin, and passing through at slack water, and by this means avoiding a heavy cross sea, which is often met with off the north end of D'Urville and Stephens islands. With regard to steamers, a vessel that could command a speed of 8 knots would generally pass through at any time of tide.

As a fishing place, this pass is equal, if not superior, to any other part of New Zealand. Boats could load with hapuka, rock cod, and barracouta in an incredibly short time; the crew of H.M.S. *Pandora* caught with hook and line fish sufficient, when dried, to last several weeks.—Remarks by Commander Drury, of H.M.S. *Pandora*, 1855.

The colonial authorities, however, condemn its use as an ordinary passage, and say that, notwithstanding the French pass is constantly used by the mail and coasting steamers running between Nelson, Picton, and Wellington, they never pass through against the tide, always going round D'Urville island; and considering the eddying nature of the currents, it is dangerous to attempt to do so, as a very slight sheer would ground a vessel in a moment; at slack water or with the tide there is no danger to a steam vessel handled with prudence. H.M.S. *Brisk* steamed through this pass on two occasions, once at slack water and once with the tide.—Remarks by Capt. C. W. Hope, H.M.S. *Brisk*.

‡ *See* Admiralty coast chart, cape Foulwind to D'Urville island, sheet VII., No. 2,616; scale, $m = 0 \cdot 25$ of an inch.

Nelson haven lies at the head of Blind bay; on the eastern shore of the bay is Croisilles harbour; on its western are also several anchorages, namely, Tonga road, Torrent bay, Astrolabe and Fisherman roadsteads, with the rivers Motueka, Moutere, and Waimea (the eastern entrance of the latter has become choked, the south bank having silted up to the northward); the depth of water in the outer parts of the bay varies from 25 to 29 fathoms, shoaling gradually to 12, 9, and 5 within 2 miles of its head.

It is entirely free from danger, and the winds seldom blow home with violence in the upper parts; indeed, it is frequently fine and calm weather at Nelson when a strong north-west gale is blowing in Cook strait.

The land at the head of Blind bay is low, with some remarkable white cliffs, but on either side it is mountainous. The Castor peaks over Croisilles harbour, mount Duppa and Double mount, over the eastern side of the bay, rise to heights varying from 3,300 to 3,840 feet; and mount Rintoul, a remarkable sharp cone 4,720 feet high, lies 15 miles south of Nelson. On the western side of the bay the land rises gradually from Separation point; 8 miles southward of the point, two peaks rise to heights of 3,700 feet, a high and generally snow-capped range extending from them southward nearly 20 miles, terminating in mount Arthur which is 5,800 feet above the sea level; this mountain is 26 miles W. ½ S. of Nelson.

CROISILLES HARBOUR on the eastern side of Blind bay, is easily accessible, affords good shelter in all weathers, and is the best eastern port of refuge in Blind bay for vessels of any size caught in north-west gales. Castor peaks 3,300 feet high lie S. ½ E. 5¾ miles from cape Soucis, its south point. Three small islands lie to the westward and southward of its northern entrance point, at distances of nearly 2 miles; the westernmost is a high conical island, with rocks extending seaward from it one-third of a mile, almost awash at high water; the southernmost is Williams island. Within these islands is foul ground and shoal water, and it will be advisable in entering to give them a berth of half a mile.*

The entrance between these isles and cape Soucis is 2 miles wide, with a depth of 16 fathoms. Working in, after passing Williams island, vessels should not stand to the northward of a line between it and the inner north entrance point, Drift-round head. There is good anchorage in 7 fathoms, mud, between this island and the head, with the island bearing W. ¾ N., and the head N.E. by N. three-quarters of a mile distant.

If it is desirable to shut the entrance in, vessels may do so by proceeding from one to 1½ miles above Drift-round head, where there is excellent anchorage, also in 7 fathoms. Hunakiwi bay, on the south side, is exposed, and not recommended for anchorage. At the head of the south-east arm (Squally cove), a narrow isthmus, half a mile across, separates Croisilles harbour from one of the arms of Pelorus sound; the land over this neck is 560 feet high, and the natives, during their wars, have frequently hauled large canoes across to escape from their enemies.

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* *See* Admiralty chart, Cook strait anchorages, sheet II., No. 2,685; scale, $m = 0·9$ inches.

Water.—Water may be obtained from a stream on the north shore one mile above the inner north entrance point.

TIDES.—It is high water, full and change, at Croisilles harbour at 9h. 0m.; springs rise 12 feet, and neaps 8 feet.

Pepin island is 9 miles S.W. ½ S. of Croisilles harbour; it is close to the mainland, and appears like a point of it, being united by a sandy beach. Vessels running for Nelson on this side of the bay may pass a convenient distance off the land, which appears to be bold and free from dangers. Pepin island will be easily distinguished by the land to the northward receding.

Telegraph.—At Wakapuake in the bight south-east of Pepin island, the shore ends of the cables to Australia and to Wanganui river are laid.

NELSON HAVEN.—The entrance to Nelson haven is 10 miles S.W. by S. of Pepin island; at the distance of 4½ miles from the entrance commences the long and remarkable Boulder bank, whose southern portion forms the natural breakwater to that anchorage.*

The available space for anchorage in Nelson harbour is limited for vessels of large tonnage, and the approach to it is exceedingly narrow, with strong tides.

Pilot.—It is absolutely necessary for a stranger to engage a pilot; an excellent one employed by Government is stationed at the entrance, and is always ready with his whale boat.

The harbour is formed between the mainland and the Boulder bank; the latter is very narrow at high water, and is in one place then covered, with a boat channel over; there are also three patches, which may be called islands, as they are always well out of water. Haul-shore island, which is little more than a cable in extent, is at the southern extreme of the bank, and has a black post on its south-east end; the next island is a small patch 4 cables to the northward of Haul-shore island, with a magazine on it; (between these islands a Pilot boat passage has been formed through the Boulder bank); and the third, 3 to 6 feet above high water on which the lighthouse stands, lies 3 cables northward of the magazine.

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* *See* Admiralty plan of Nelson anchorage, No. 2,185; scale, *m* = 10·0 inches.

LIGHT.—The Boulder bank lighthouse, a white tower, one mile northward of the entrance channel, exhibits a *fixed* light, showing white seaward through an arc of 120°, or between the bearings of S. by W. ¾ W., through east, to E. by N.; and *red* between the bearings of E. by N. to N.E. by N. The light is 60 feet above the level of high-water springs, and should be seen in clear weather from a distance of 13 miles. It is about 10 miles south-westward of Pepin island, and 3¾ cables N. by E. of the Powder magazine, in latitude 41° 15′ 4″ S., longitude 173° 17′ 7″ east of Greenwich.

Arrow rock, a high sharp rock, lies in the centre of the entrance a short cable southward of the edge of the Boulder bank, which latter is marked by a barrel beacon; and between the two is the entrance ledge, with only 3 feet water on it at low tides. The passage in is to the northward of this ledge, between it and the beacon, and does not exceed 50 yards in width.

Buoys.—Buoys mark the channel leading to the entrance:—the Fairway buoy, a red spiral buoy surmounted by a white beacon lies at the extreme end of the Waimea sand in 3½ fathoms at low water, the lighthouse bearing E. by N. 5¾ cables; magazine, S.E. by E. ½ E.; and Arrow rock, S.S.E. ⅜ E.

Bar buoy, red in 7 feet, marks the east end of a 6-feet bank, with the lighthouse bearing N.E.; magazine E. by N. ⅝ N.; and Arrow rock S.E. ½ S.

Bolton hole, a red spiral buoy in 13 feet, lies N.W. by W. ¾ W. 6 cables from the Arrow rock; whilst the Bell buoy, marking the fairway of the channel entrance, lies with the red and white beacons in line, and W. ¼ S. 2½ cables from the same rock. The inner edge of the bar is 1½ cables outside Bolton hole buoy; the bar is 4 cables across, with 7 feet on it at low water.

Vessels of large tonnage can therefore only cross the bar and enter the harbour at or towards high water, when there is at springs a depth of 20 feet.

With a strong north-west wind a vessel would scarcely run for Nelson haven, but take shelter in Croisilles harbour until it moderated; it is not often, however, that this wind blows home with any violence at the head of Blind bay.

DIRECTIONS for ENTERING NELSON HAVEN.—Vessels running into Blind bay for Nelson with a fair wind should get the eastern shore on board, and make the Boulder bank from 2 to 3 miles northward of the haven, running along its outer edge under easy sail at the distance of a mile, carrying 6 or 7 fathoms water.

Outer anchorage.—There is good anchorage outside the bar in all moderate weather. The mark for anchoring is the lighthouse bearing

S.E. distant three-quarters of a mile, or with Stafford's house in line with the magazine S.S.E. ½ E., in 6 fathoms water, but mariners are *cautioned* not to run out of the white into the *red* light, but to keep well within the former.

From a survey made by Capt. Johnson in 1882, it was found that the Bar in the direction of the old course had much shallowed, the Fairway now being more to the eastward; consequently the marks, formerly used for crossing the Bar, no longer hold good.

Vessels bound in should make the Fairway buoy passing it at the distance of a cable on the starboard hand, thence steer to pass just eastward of the Bar and Bolton hole buoys, rounding gradually to and passing close northward of the Bell buoy, when the Arrow rock will be little more than 2 cables distant; the beacon on the edge of the Boulder bank will then be seen, and also the leading marks throughout the Narrows.

Note.—The channel lies between these buoys and the Boulder bank; its narrowest part on the bar, 2½ cables wide, is abreast the Bar buoy, and with not less than 7 feet at low-water springs, 17 feet at high-water neaps, and 20 feet at high-water springs. It has been observed that, at times during neap tides, the rise and fall is as little as 6 feet.

Beacons.—Two beacons have been erected on the east shore to be kept in line on entering:—upper beacon, white with circle; lower beacon, red with triangle. By night a white and *red* light will be exhibited on their respective beacons. (The Storehouse door just behind them, and the chimney of Stafford's house, also in the same line, were the marks for entering, before the beacons were erected.) These marks will lead northward of the entrance ledge, passing the beacon on the tail of the Boulder bank at the distance of 25 yards; when the vessel is midway between the black post on Haul-shore island and the upper beacon on the starboard shore, haul up sharply N. by E. ¾ E., or keep little more than half a cable off the wharf ends.

The light on the Pilot house is discontinued. When a vessel is known to be approaching Nelson haven at night, a white light is exhibited on the beacon off Haul-shore island.

Anchorage.—A good anchorage is with the black post on Haul-shore island in line with Arrow rock, and abreast Government wharf in 7 fathoms mud at low water, when the body of the town of Nelson will be just open; it is necessary to moor.* The best anchorage for a large vessel is just round Haul-ashore island, in 5 to 6 fathoms mud, as there it is still water and the ship is moored head and stern, there being a mooring buoy for the stern chain. Two mooring buoys, painted black, are laid down in the harbour.

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* H.M.S. *Basilisk* in September 1871 parted a cable in this anchorage during calm weather, owing to the eddying nature of the tides, and also to the water rushing over the Boulder bank, through the boat passage; this is caused by the water rising faster outside the bank than in the harbour.

Small vessels and coasters enter Nelson haven with ease on the flood tide; and under the skilful guidance of the pilot, vessels of 1,000 tons have been conducted to safe anchorage with scarcely less facility. To enter, a vessel must have a wind which will enable her to lay E.N.E. through the narrow channel between Arrow rock and the Boulder bank; after the tail of the latter is passed, the tide will take her to a berth.

After heavy rain, freshets increase the strength of the tide considerably, thereby rendering the turn in the passage dangerous, the current strikes the vessel on the port bow and would set her on shore if helm is not promptly given, the channel being only half a cable wide abreast of the beacons.

Caution.—It must be observed that the preceding directions, though accompanied by the elaborate and clear plan published by the Admiralty, ought not to justify a stranger in attempting to enter the haven without a pilot unless in great emergency.

TIDES.—It is high water, full and change, at Nelson haven at 9h. 50m.; springs rise 14 feet, and neaps 10 feet. The streams of tide change 17m. after high and low water at springs: the flood runs 7h. 10m., and the ebb 5h. 40m. The tides run rapidly along the eastern shore of the harbour, but by anchoring on the line directed, a vessel will be out of the influence of their greatest strength.

In consequence of the great range of tide, Nelson haven is one of the few places in New Zealand where a vessel of large tonnage may be beached for repairs. H.M.S. *Fly* (485 tons), as well as large merchant vessels, have been placed ashore for this purpose on the sandy beach on the inner side of Haul-ashore island.

Bolton Hole anchorage, is a deep hole 4 cables westward of Haul-ashore island, or between the tail of the Boulder bank and the eastern end of the Waimea bank, where there is anchorage in 6 and 7 fathoms, sheltered in some measure by the bar outside it. A good berth is half a cable westward of the line between the buoys (Bolton hole and the Bell), with the south end of Haul-ashore island in one with Stafford's house.

Waimea river.—The eastern entrance is now closed, owing to the silting up of the south bank to the northward.

The central and western mouths of Waimea river are respectively 2½ and 6½ miles westward of Nelson, and navigable for coasters. Two miles N.W. of the western mouth commence the White cliffs, which extend more than 3 miles along the coast; these cliffs are in some places 250 feet high, remarkable, and are seen a long distance from seaward.

The coast between Nelson haven and the White cliffs is shoal, having 4½ fathoms at a distance of 2½ miles from it; north-eastward of their southern or highest part, more than 2 miles off shore, there is a patch of less than 3 fathoms. At the north-west end of the cliffs is Moutere river, which has two entrances 2 miles apart; it is a smaller river than the Waimea.

Motueka river.—At 3½ miles to the northward is Motueka river, and between are two small low islets with sand-flats, extending nearly one mile off shore.

The channel is marked by beacons, painted red on starboard side in entering, and black on port side; a black buoy is placed at the entrance.

BLIND BAY—FROM SEPARATION POINT TO MOTUEKA RIVER.

SEPARATION POINT, the north-western extreme of Blind bay, and which separates it from Massacre bay to the westward, is a small cliffy projection connected by a neck with high land rising immediately from it.

At the distance of 1½ miles S.E. of Separation point is a remarkable white stripe in the cliffs, which can be seen at a long distance, and be advantageously used as a mark for clearing the end of cape Farewell spit.

AWARUA BAY, 3 miles in extent with sandy beaches, and having from 7 to 10 fathoms water, lies immediately southward of the white stripe, with anchorage off in 10 fathoms in moderate weather. From its southern point which is rugged and cliffy, the coast, of the same character, extends 2½ miles in a south-easterly direction to Reef point, the north point of Tonga roadstead.

TONGA ROADSTEAD.*—This anchorage is 7 miles from Separation point, and is a snug haven with all westerly winds from north to south. The bay is half a mile in depth, with a smooth sandy beach at its head; the small island of Tonga, about 2 cables in extent, lies off the centre of it, and the anchorage is about 4 cables westward of the island in 8 fathoms. There is a passage on either side of Tonga island, that to the northward being over 3 cables wide, with 8 and 9 fathoms, the southern is half a mile wide, with from 6 to 10 fathoms; vessels entering to the northward of the island must avoid a reef which extends off Reef point more than a cable.

TORRENT BAY,† the next anchorage, is 3½ miles to the southward of Tonga island, and 11 miles from Separation point; the intermediate coast is cliffy, varied with small sandy coves. Several rocks extend more than half a mile off shore, and a long reef awash at high-water lies about midway between the two anchorages, with a small islet one mile to the southward of it; this part of the coast should not be approached within one mile.

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* *See* plan of Tonga anchorage on Admiralty coast chart, cape Foulwind to D'Urville island, sheet VII., No. 2,616.

† *See* plan of Torrent bay and Astrolabe road on Admiralty coast chart, No. 2,616.

Torrent bay is more than half a mile in width between its north and south points (North and Jetty points); the basin, in the southern bight, affords good shelter for small vessels in 3 to 3½ fathoms, except in north-east winds; in the outer part of the bay there is good anchorage in 6 and 7 fathoms, with off-shore winds. Three torrents discharge themselves into the basin through deep ravines; hence its name.

ASTROLABE ROAD* is a mile southward of Torrent bay, and is separated from it by a peninsula, the neck of which is 6 cables across. The anchorage is between Adolphe point, its northern point, and Adéle island; the latter is nearly one mile in length, and lies 4 cables from the shore.

Hapuka reef is a quarter of a mile eastward of Adolphe point, having a narrow channel inside it with a depth of 6 fathoms, this rock dries 2 feet at low-water spring tides.

Beacon.—An iron beacon with cage painted red, 13 feet high, marks Hapuka reef.

Danger.—There is also a sunken and dangerous rock, with 6 feet on it at low water, lying in the entrance, a quarter of a mile northward of Jules point, the north-east extreme of Adéle island. The main channel between this sunken rock and Hapuka reef is 4 cables wide, with 8 fathoms water. There is also a narrow passage between the sunken rock and Jules point, with the same depth of water.

Clearing marks.—When on sunken rock, the outer or eastern summit of Tonga island is seen midway between Adolphe point and Hapuka reef; it is avoided by keeping the latter reef on board within about a quarter of a mile in entering; and so long as the north end of the sandy beach northward of Guilbert point on the mainland is seen just open of the north-west cliffy extreme of Adéle island, a vessel will be to the northward of it.

Anchorage.—The anchorage is half a mile within the entrance points in mid-channel, in 6 fathoms, the passage between Adéle island and the mainland being open. This passage is nearly half a mile wide in its narrowest part, with 12 feet the least depth at low water, so that a small vessel can obtain shelter from all winds on the west side of Adéle island. Astrolabe roadstead will be found a snug anchorage with all westerly winds from north to south.

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* *See* plan of Torrent bay and Astrolabe road on Admiralty coast chart, cape Foulwind to D'Urville island, No. 2,616.

Tides.—It is high water, full and change, in Astrolabe road at 9h. 10m.; springs rise 14 feet, and neaps 10 feet. The tides are not much felt in Blind bay, varying from a quarter to one knot along the shores, but with northerly winds a current generally sets to the southward at the rate of nearly one mile an hour.

FISHERMAN ROAD is to the southward of Adéle island, between it and Fisherman island, an adjacent small rocky islet; it is 3 cables across the entrance, with good anchorage in 20 feet at low water, midway between the two islands. H.M.S. *Acheron* found good shelter here.

Caution.—From Fisherman road Motueka river is 5½ miles to the southward with sandy bays and small coves on the coast between, where shelter may be had for boats; but large vessels running down this side of Blind bay should keep at least 2 miles off shore, and when approaching to abreast the White cliffs increase their distance to 3 miles.

Light.—" A light is exhibited at the store, Rewaka river (about 1½ miles north-westward of Motueka river), 12 feet above the level of the sea, showing *green* northward, white eastward, and *red* southward, and will be altered as the river changes.

The light will only be shown when required, and mariners are warned not to be guided by it, unless well acquainted with the river."*

FROM SEPARATION POINT TO CAPE FAREWELL.

MASSACRE BAY, the westernmost anchorage in Cook strait, lies between Separation point and cape Farewell, the north-west extreme of the Middle island of New Zealand; the land on both the western and southern sides is high. On the former side an extensive valley lies between two mountain ranges, through which winds the Aorèrè river;† on the southern side of the bay, about 15 miles from Separation point, and westward of the range which extends from that point, commences the Rangiora or Aopuri range, running in the same direction about 10 miles, the mountains varying in height from 4,400 to 5,400 feet.

Cape Farewell terminates rather abruptly, its extreme showing from the eastward like an isolated cliff, descending in steps to the westward.

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* Nelson Almanac.

† On the banks of this river, and in their neighbourhood, extensive coal-fields of good quality were said to be discovered in 1851.

The land immediately within the cape is from 400 to 600 feet high, and 5 to 6 miles southward of it, mountains varying in height from 1,000 to 4,000 feet extend to the south-west until they nearly meet the Rangiora or Aopuri range.

The most remarkable coast mountain on the western shore of Massacre bay is mount Burnett or Knuckle hill, which has a double rounded summit; the northernmost and highest is 2,085 feet high; it is nearly 9 miles S.S.W. from cape Farewell, and about 2 miles from the beach; it can be advantageously used as a leading mark to clear Farewell spit.

FAREWELL SPIT extends from cape Farewell in an easterly direction 17 miles, slightly curving to the southward towards its extreme, and is the danger which ships must be careful to avoid in entering Cook strait from the westward or northward. Several vessels have been wrecked on it, but this has generally arisen from a want of due caution; it is, however, a treacherous spit, so great a part of its eastern extreme being covered at high water, and its southern or inner side being very steep-to.

The portion which is always above water extends 13 miles from cape Farewell, and maintains an average width of a little more than half a mile: it is composed of low sand mounds partially covered with vegetation. There is a cluster of bare sand hillocks midway between the cape and the extreme, the highest of which is 90 feet above the sea, and at the high-water extreme, or Bush-end point, are several scattered bushes.

Soundings.—From Bush-end point, the low-water extreme of the spit which dries in patches, extends S.E. by E. 4 miles, and the water shoals suddenly at the distance of 1½ miles outside it, from 25 to 5 fathoms. On the northern or outer side of the spit the water shoals gradually from 40 and 35 fathoms (sand) 5 miles off shore, to 14 fathoms within one mile of it.* On the southern or bay side the sand dries in patches for more than 3 miles from the high-water edge of the bank, and in some parts for even 6 miles to the southward, there are only a few feet water, shoaling suddenly to that depth from 7 and 20 fathoms.

LIGHT.—The lighthouse on Bush-end point is 113 feet high, painted in alternate bands of red and white. The light is a *revolving* white light, excepting in the direction of the spit end, between the bearings N.W. ½ N. and W. by N. ½ N. where it is *red*, attaining its greatest brilliancy *every minute*; it is elevated 120 feet above the level of the sea, and in clear weather should be seen from a distance of 17 miles. The light is shut in by the sand-hills to the southward of E. by S.

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* The spit, it is reported, has shoaled considerably to seaward since the last survey was made.

Caution.—Vessels should not open the northern edge of the *red* light within 4 miles of the lighthouse.

TASMAN CORNER, in the north-west part of Massacre bay, is a horse-shoe shaped space of deep water, with good anchorage in 7 and 8 fathoms, well sheltered from easterly winds by the banks just mentioned extending to the southward of the spit. It is 4 miles in extent either way; and so long as Fossil cliff, the eastern extreme of cape Farewell, is not brought to bear to the westward of N.W. by N., a vessel will be well clear of the banks which form the eastern boundary of the anchorage.

Anchorage.—Some patches of this bank are always dry, which will be the best guide, anchoring 2 miles to the westward, or midway between them and the shore; mount Burnett bearing S.W., and Fossil cliff N.N.W., in 7 fathoms.

With northerly or westerly winds this is a sheltered anchorage, and with easterly winds the water is smooth, being protected by the bank; to south-east winds it is in a measure open, but no heavy sea could get up; and there is no reason to doubt that with good ground-tackle, a vessel would ride out any gale from that quarter. A heavy surf, with only a moderate wind, frequently sets on the beach, which is shoal for nearly one mile off. H.M. surveying vessel *Acheron*, in 1850, lost an able surveying officer, Mr. Burnett, and part of a boat's crew, attempting in a whale boat to pass through this surf at night during a fresh breeze; this accident occurred at Memory creek, about 5 miles southward of Fossil cliff, which nearly meets one of the arms of Wanganui inlet, on the outer coast where the party had been employed surveying.

Aorèrè river.—The entrance of this river is 2¼ miles south-east of mount Burnett; its southern head is a streaked cliff; the northern, a sandy point. The bar of the river extends more than a mile off shore, and is dry at low water, except a narrow channel with one foot water in it.

COALING ROAD.—From Aorèrè river the coast of Massacre bay trends south-eastward 12 miles to Coaling road, which is 6 miles westward of Separation point, and has good anchorage with southerly or easterly winds off Motu-pipi river in 4 fathoms, 1½ miles from the shore at high water; at low water the sands dry nearly one mile from the river's mouth, and large boats only can enter at half-flood. Coasting vessels are built here.

Coal.—Coal was obtained with much facility from the face of some remarkable white triangular-shaped cliffs at the river's mouth; but as far as it had been superficially worked, found to be of an inferior quality, and highly sulphureous. It was used on board H.M. surveying vessel *Acheron*, but would not keep the steam up unless mixed with more than an equal proportion of New South Wales coal.

Tata anchorage.—On the eastern side of Coaling road, 2 miles E.N.E. from the anchorage, and 4 miles south-westward of Separation point, is Tata point, and two small islands of the same name; within these islands is a small anchorage where two or three small vessels may obtain good shelter from north-west winds. A vessel of large tonnage might also get shelter by passing close round the south end of the southern island, and dropping her anchor just within.

There is a passage for small vessels between the two islands, but not between the northern island and the point of the mainland, as a 5-feet bar extends from the centre part of the former directly across: just northward of Tata anchorage is Burial bay; it has a sandy beach, and is shoal a short distance within the points.

DIRECTIONS FOR ENTERING MASSACRE BAY.—The general depth of water in Massacre bay is from 10 to 20 fathoms, and it affords good shelter in all parts, with north-west winds; the only danger to be avoided is Farewell spit, for which is given the following directions:—

A vessel running for Massacre bay to obtain shelter should make the high land of Separation point, and by not bringing it to bear to the southward of S.S.W., will ensure her passing nearly 4 miles to the eastward of the extreme end of Farewell spit; when the remarkable White stripe can be made out (1¼ miles south-eastward of Separation point), and which in clear weather can be seen a long distance outside the bay, it may be brought to bear S. ¾ W., and steering for it on that course, will lead 2 miles from the Spit end, in 25 fathoms. When mount Burnett bears W. by S. ½ S., the southern edge of the spit is cleared, and a vessel may haul into the bay.

If bound for Tasman corner, mount Burnett should be kept on the above bearing until Fossil cliff bears N.W. by N.; the dry patches on this spit will then be seen about 3 miles to the northward, and a course may be steered for the anchorage as before directed.

DIRECTIONS for VESSELS entering COOK STRAIT from the SOUTH-WEST.—A vessel entering Cook strait from the south-west with a fair wind, after making the land southward of cape Farewell, should run along it at a distance of about 3 miles;* when abreast the cape at that distance due north of it, a course should be shaped E. by N. ¼ N. for 14 miles, when she will be 6 miles northward of Bush-end point, the high-water extreme of Farewell spit, and the bushes as well as the lighthouse will be in sight; the course now should be S.E. ¼ E. about 12 miles,—when Separation point ought to bear S.S.W.—or until the White stripe is made out and brought to bear S. ¾ W., when courses may be steered for either Massacre or Blind bays.

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* A remarkable sand patch shows out at cape Farewell, on making the land from the westward, which most probably is the Sandstone island marked on the chart.—Remarks by Navigating Lieutenant T. H. Tizard, H.M.S. *Challenger*, 1874.

At night, *see* caution as to *red* light (p. 198).

If bound through Cook strait or for port Nicholson, pass a convenient distance northward of Stephens island. D'Urville and Stephens islands will be seen in clear weather off the end of Farewell spit, and generally from a greater distance.

Tides.—It is high water, full and change, at Motu-pipi river, Coaling road at 9h. 50m., and at Fossil head in Tasman corner at 8h. 45m., springs rise 14 feet, and neaps 10 feet. On the outer coast of cape Farewell it is high water at 9h. 0m., the westerly or flood stream commencing at 6h. 0m., and the easterly or ebb stream at 12h. 0m.

CHAPTER VI.

FROM CAPE MARIA VAN DIEMEN TO NEW PLYMOUTH.

VARIATION in 1883.

Cape Maria Van Diemen 13° 00′ E. | Manukau harbour 13° 50′ E.

In completing the description of the west coast of the North island, it is considered desirable to commence at cape Maria Van Diemen the north-west cape, and proceed southward, in preference to following the coast northward from New Plymouth, as vessels from Auckland or the harbours on the east coast bound for the western ports would unquestionably adopt the northern route; while those from the westward, bound to Hokianga river or Kaipara harbour, frequently sight the Three Kings islands and run down the coast for those ports; this arrangement will, therefore, be obviously more convenient.*

CAPE MARIA VAN DIEMEN is lower than the land east of it; it projects from a sandy isthmus, and makes like an island, and bears from the south-western extreme of the Three Kings islands E. by S. ¾ S. distant 36 miles. A small double islet lies immediately to the north-west of the cape, but with no channel between.

LIGHT.—(For description of light, see p. 33.)

Caution.—The tides off this cape are rapid, and races are frequent; it is therefore advisable to give the coast a berth of 3 to 4 miles; indeed the tidal influence here extends to the Three Kings; along the north coast the flood sets to the westward, and on the west coast to the southward; 1½ miles from the shore the tides are generally twice as strong as 3 miles off.

PANDORA BANK, lying 6 miles S. by W. ½ W. of cape Maria Van Diemen, frequently breaks heavily, and sometimes appears like a race, but not less than 5 fathoms has been found; the shoal part covers 2 square miles, and is of hard sand, covered with sea-weed. Immediately seaward there is 20 fathoms, and between it and the shore is a channel with a depth of 13 fathoms.

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* *See* Admiralty coast charts, sheets I., II., and VI., Nos. 2,525, 2,543, 2,535; scale, m=0·3 inches.

COAST TO REEF POINT.—Six miles south-east of cape Maria Van Diemen commences the hard sandy beach, which extends in the same direction about 40 miles to Ahaipara; the only interruptions along its whole extent being the small rocky islet Motu-pea and the Monganui rocks. The former, 11 miles from the cape, is about half a mile from the beach, and 100 feet high; although there is an appearance of deep water within Motu-pea, the constant rollers would prevent even a coasting vessel taking the channel.

Monganui, a fishing retreat of the natives, is a rocky projection 15 or 20 feet high, connected with the sands at low water, and is 6½ miles distant from Motu-pea. A range of white sand-hills, varying from 100 to 300 feet in height, extends along this coast a short distance within the beach line; at a distance of 5 miles from the shore the soundings are from 20 to 25 fathoms, grey sand.

AHAIPARA ROADSTEAD, at the extreme of the sandy beach just mentioned, affords no shelter from westerly winds, but in fine weather vessels of any tonnage could ship the produce of the Victoria plains and of the fertile country at the foot of the mountain range, extending from Reef point to the eastward; in the small nook within (Ongonga) boats can ship cargo.

The approach is clear, and the anchorage is after bringing Reef point (*Tau-roa*) to bear S.W.: the soundings decrease gradually from 10 fathoms, the bottom fine sand. South-west and south-east winds are favourable for lying at this anchorage; it is also sheltered from north-east, but as the gales from this quarter veer to north-west, it would not be prudent to remain.

REEF POINT is a long table projection, sloping down from hills chequered with sand; a spit of sand which generally breaks, extends half a mile to the westward. One mile west of the point 16 fathoms will be found; the tide, which runs from 2 to 3 knots, is imperceptible in Ahaipara bay; 1½ miles south-east of Reef point is a remarkable sandy ravine; the sea is said to be encroaching fast on this part of the coast.

FALSE HOKIANGA (*Herekino*)* is 9 miles south-east of Reef point, and 16 miles north-westward of Hokianga river; it is a small and dangerous harbour, with a swell always setting on the beach; no vessel drawing over 6 feet water should approach it, and then only in fine weather. On the north entrance are sand-hills chequered with green patches, and from the south head bare hills rise suddenly to an elevation of 800 feet, and continue the same height to Wangape, with a table summit and deep ravines showing to seaward.

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* False Hokianga was mistaken for Hokianga river by H.M.S. *Osprey* in 1846. From this cause she was wrecked there: a few of her timbers still remained on the north entrance in 1854.

WANGAPE, a small port 5 miles south-east of False Hokianga, is used by small vessels in fine weather ; it has no bar, but there is a sunken rock in the channel, which is less than a quarter of a mile wide ; the tides are strong and set across from point to point, so that a vessel entering with a strong flood would inevitably be carried on shore. There is a depth of 5 fathoms in the channel, the northern side of which is the best ; there is also a sunken rock (*Maniaua*) said to exist at the entrance.

The heads of Wangape are bold, and the land on either side is high, and continues so 4 miles southward of the entrance, when the range terminates and is succeeded by a sandy beach, backed by sand-hills varying from 100 to 300 feet high, which extends 7 miles to the north head of Hokianga river.

HOKIANGA RIVER is the northernmost port on the west coast accessible to ships of burthen. It flows in a north-easterly direction for 20 miles between the wooded ranges of Waima and Punghuru, whose steep sides approach the banks at distances varying from 4 to 10 miles, supplying the main river by large tributaries winding through valleys of great capabilities. These mountain ranges are from 1,500 to 2,000 feet in height ; Maungataniwa, at the head of Maungamuka river, is elevated 2,150 feet, probably the highest mountain north of the Hauraki gulf. Hokianga river is navigable, and has few obstructions for a distance of 15 miles from the heads, the depth in the channel varying from 4 to 26 fathoms, mud and sand, and the water is salt to its source.*

DIRECTIONS FOR ENTERING. — In approaching Hokianga river, a stranger should be confident of the latitude, for reason of the similarity which exists in some points between it and the small ports to the northward, and the possibility of being thus mistaken in thick weather, as in the case of H.M. Brig *Osprey*.

The entrance may be known by the North head of the river being the southern termination of a sandy range (before-mentioned) which extends 7 miles to the northward, and is from 100 to 300 feet in height, while to the southward of it no sand-hills are to be seen until passing Mongannui bluff, which is 2,046 feet high, falling abruptly to the water 18 miles southward of Hokiang a river. On a tolerably clear day the Bluff will be seen from a vessel approaching from the northward or westward long before reaching the entrance of the port. There is no high land like it on the coast, and it is a good mark to make at any time for vessels approaching Hokianga or Kaipara.

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* *See* Admiralty plan of Hokianga river, No. 1,091*a* ; scale, *m* = 3·0 inches.

A constant swell from the westward breaks heavily on the beach, and the bar is almost always breaking; vessels should, therefore, be prepared for shipping a sea; three rollers generally are experienced before the bar is passed.

A vessel should be off the entrance, so as to carry the flood into the harbour; and about half-flood is the best time for crossing. Should the first of the ebb have made, and the bar appear passable, it must still be borne in mind that there is a tide of 5 knots to contend against, with the chance of the wind falling, as also that the anchorage between the bar and the heads is bad.

BAR.—The Government of New Zealand published the following Sailing directions for Hokianga river bar, the result of a survey made in 1878 by the Colonial steam-vessel *Stella*:—

The shoals forming the bar at the river entrance extend as formerly, in a north-west and south-east direction for about 2 miles, at the distance of from 1½ to 1¾ miles from the Heads, with two channels (North and South), in both of which a least depth of 18 feet was found at low-water spring tides. In the former main channel, a depth of only 9 feet was found; consequently, the beacons for this channel have been removed, and will not again be erected.

The soundings close outside the bar, decrease suddenly from 8 to 3½ fathoms. Monganui bluff in line with a low point about 6 miles south-east of the outer South head, leads close outside the bar shoals.

Leading mark for NORTH CHANNEL.—Andrews store (the southern house on the beach in Martin bay) in line with the extreme of South head, bearing E. ⅜ N.

Leading mark for SOUTH CHANNEL.—The Schoolhouse (a conspicuous single white building on the rising ground northward of the old Pilot's house) in line with the extreme of South head, bearing N.E. ½ E.

Directions.—The South head, 150 feet high, has a large white signal staff on it, from which the International code and General signals for New Zealand ports are shown. Mariners should be guided by these signals, especially the semaphore arm (*see* page 15) by which vessels are directed over the bar to a position within the Heads where a pilot will board them.

Note.—From the frequent changes of the bar, mariners are cautioned not to place reliance on the leading marks for the channels, but should follow the above directions:—

Vessels should not attempt to cross the bar, except with a leading wind and moderate weather, and never unless directions are signalled.

At the entrance between the heads there is a depth of from 16 to 27 fathoms, but there are two dangers on the north side of the channel, which narrow it considerably; these are the Nine-feet rocks, and a patch of 2 feet off the North head.

Caution.—It must be remarked that the ebb sets directly on the South head spit, and in going out due allowance must be made for clearing it; several small vessels have drifted on this spit during light winds.

Martin bay.—This bay is just within the South head, and has no dangers, the holding ground is good, but there is generally a considerable swell; it is therefore better in entering not to anchor until past the Middle ground. Vessels outward bound, anchor here to await an opportunity of crossing the bar.

Middle ground.—A good channel exists either side of the Middle ground, but the eastern channel is the broadest.

Wairohea river.—The foul ground off this river frequently causes a race, and the outer ledge is only dry at low water springs.

After passing the South head, and when it is brought to bear S.S.W., steer N.N.E. until Young point bears N. ½ E., then steer for that point until past the Middle ground, when edge a little to the westward, passing midway between it and the low sandy point Rangi; to avoid the bank extending southward of Young point, do not shut the north head in with Rangi point.

When abreast Young point, steer for the next point (Kowhare) on the same side: passing Mahena island 4¼ fathoms will be found the least water: keep not less than a cable from Kowhare point, which has rocks off it covered at half-tide. From Kowhare, steer over towards Tekaraka point to avoid an extensive flat lying between the former and Ouoki point, but when nearing Tekaraka edge away for Direction head, not approaching within a cable of Tekaraka, as rocks dry off it to the southward at low water.

From Direction head, the river course in mid-channel is N.E. by E.; there are no dangers but the low water edges of the banks, which extend a short distance without the line of the points.

From Mutawhera point, which is steep-to, keep Hurd point (a long low point) on the starboard bow, to avoid an extensive flat formed by the Omanai river: from abreast Hurd point, steer for the north point of the Narrows.*

NARROWS.—To pass through the Narrows, which are deep, a vessel should have a commanding breeze or slack water, as the tides, which occasionally run 4 knots, set from point to point.

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* *See* Admiralty plan of Hokianga river, No. 1,091*b*; scale, $m = 3{\cdot}0$ inches.

The only danger in the Narrows is the Takataka rock, which is just covered at high water, one-third of the way across from the north point of the upper end of the Narrows: it is steep-to from the southward, but there is no channel between it and the north shore.

From the Narrows, give the north bank a fair berth, steering for Motu-ti, a low sandy islet: below this islet, and abreast Kokohu (Mr. Russel's station), is as high as vessels of burthen can proceed. The width of the deep water channel here is 2 cables, and the anchorage is in 4 to 5 fathoms.

In working up or down the river, as a general rule, a vessel should not stand within the line of the points, as the mud-flats in all the bights, however deep, extend from point to point, and are invariably steep-to. The Narrows should be passed with a leading wind, unless a pilot understanding the set of the tides should undertake to work a smart vessel through.

Creeks.—There are four extensive salt-water creeks on the west bank of the river, within 7 miles of the head, meandering through miles of mangroves, and terminating near the foot of the Punghuru mountains; they are the Pupuwae, Ohihupa, Punehu, and Waiho.

Pupuwae creek is all dry at low water, and one mile from the mouth expands into an extensive mangrove flat; a small fresh-water stream winds among three remarkable peaks, with kauri trees on their slopes.

Above this valley is the termination inland of the great sandy hill ranges, and on their summit is a fresh-water lake, about three-quarters of a mile in circumference. It appeared to be deep, was covered with wild-fowl, and is about 600 feet above the level of the sea: several fish were seen jumping, apparently about a quarter of a pound in weight: the natives call them Nioioni, described as a fish of many colours.

Ohihupa, the next creek, is also dry at low water; at Mata point, just to the southward of the creek, was an Englishman's house (Munro); the country between these creeks to the hills is excellent soil.

Punehu creek runs 2½ miles, navigable for boats at half-tide; the south bank is inhabited by natives and well cultivated: the north shore is thickly wooded with kauri and totara; at the head is another native village.

Waiho creek, 7 miles from the heads, is similar to Punehu; the mangroves, through which it winds, extend across half a mile: the south bank is partially cultivated, and at the head is an extensive valley, clear of timber and uncultivated, terminating at the foot of the Punghuru range. It is said that small schooners have been some distance up, if so, they must ground on the mud at low water. From Whakarapa, a deserted village at the head, the creek winds to the northward for one mile, where the water is nearly fresh.

Motuti creek, under Direction head, is a small but useful creek, as much timber was floated down it from the forests: it extends about 3 miles in a N.N.W. direction.

TRIBUTARY RIVERS.—The tributary streams which empty themselves into the Hokianga river on the west side are, the Motukaraka, Maungamuka, Orewa, and Hauraki, the latter a continuation of the Hokianga itself; those on the east side are, the Waima, Omanai, and Wirinaki.

These rivers can scarcely be considered navigable for vessels drawing more than 6 feet, and the channels are generally narrow; about half-way from their source the water is fresh at half-tide. Their entrances are lined with mangroves for 2 or 3 miles, when the shores approach, wooded and steep, until the boughs reach across: in some the rapids are strong after heavy rain.

The bed of Hokianga river is for the most part soft mud, except near the mouth, where there is in the Middle ground a hard sand-bank, and for the first 5 miles the bottom has a sandy superficies, caused by the great sand-drift from the westward, which has also impregnated the whole coast with sand for some miles into the interior; indeed, wherever the west coast has a slope sufficient to retain the deposit, it will be found to be of fine yellow sand, of depth according to the exposure.

The argillaceous white cliffs, from 15 to 30 feet high, falling perpendicular to the high water line, are common to both banks of the Hokianga river; off these, and extending along the shore, are huge boulders of iron sand-stone, some of them nearly round in shape and 30 feet in circumference; they do not, however, reach beyond the low water mark.

Motukaraka river, named after an island at its mouth, is the first river on the west side; it extends in a north-west direction, and has only one foot at low water at the entrance, but deepens above. The hills on both sides, about 100 feet high, are well wooded, chiefly by the puriri tree; the mangroves are extensive, but there are bold points on either side to the low water. Four miles from the entrance is fresh water, running through a plain; there is a small native settlement at the head.

Maungamuka river is the next stream of any consequence; it is 2 miles above the Narrows, and is a river of considerable importance, down which most of the timber is conveyed. It is navigable for 3 miles at low water for vessels drawing under 12 feet, and the channel is more than a cable wide; above this the channels are for some distance narrow and intricate, when it improves again, and as the water becomes fresh, the timber ponds are seen on the west bank.

Four miles from the mouth, at the end of the mangroves, the hills descend steep to the water's edge, the channels are narrow, and the freshes come down with great force; 1½ miles above is Maungatipa village. On the east bank, opposite this village, the clay cliff is perpendicular, and 30 feet high; Pungaheke village is with the windings of the river 1½ miles beyond this, above which no boat can proceed; on the east bank of the river was a small settlement of Wesleyan missionary natives. A track from the head,—indeed, it is the main communication,—passes over the shoulder of Maungataniwa mountain to Kaitaia and Monganui in Doubtless bay.

Orewa river, running parallel to the Maungamuka, but of less extent, was also much used for transporting kauri spars; these, about 2 miles up the river, are still very abundant; the water soon becomes fresh, which is important for preserving the spars. The head of the river divides into three small streams, running through a raupo valley, about 3 miles from the mouth.

Hauraki river must be considered the termination of the Hokianga, which becomes navigable only for boats from this point; 6 miles above are the rapids. Near its source there is a road to the bay of Islands; there was one English settler on its banks, besides Mr. M'Donnel's large station above the Missionary establishment.

Waima river.—This stream is on the southern shore of the Hokianga, below the Narrows, and no doubt will be its most important tributary. At near high water, vessels of 12 feet draught could get into the river and anchor in 4 fathoms at low water, and afterwards might go up, lying safely on the mud; it runs in an easterly direction 11 miles to the rapids. A Wesleyan mission station was within 3 miles of this, on a branch that runs to the south, and about half a mile from the river; there was an excellent bridle road from it to the Bay of Islands, a day's ride.

Omanai river, south of Hurd point, runs 4 miles to the south-east, and has its banks under cultivation by the natives; the hills are of moderate height, and cleared on both sides. Its navigation is similar to the other streams, and fresh water is met with 3 miles up.

Wirinaki river, the last tributary of any importance on the south shore, and 7 miles from the heads, presents a channel deep and broad for the first mile, but has at low water only one foot at its mouth. It had more natives on its banks than on any of the former streams described; and the creeks winding through the mangroves from the main stream, led to their habitations.

STATIONS.—The principal points or heads on Hokianga river were in 1854 occupied by English. Young point (*Kehotu-mongero*), Manning point (*Onoki*), Munro point (*Mata*), Hurd point (*Rawi-ne*), Mr. Russel's station (*Kokohu*), the Wesleyan mission station opposite to Kokohu, and Mr. M'Donnel's at Hauraki, were the principal stations. The largest native village was Pakanae, the chief of which, Rangatira, had much land under cultivation. Kokohu was one of the best residences in this part of New Zealand; and its late proprietor, Mr. Russel, was the chief exporter of timber; ships of any burden may anchor off it.

TIDES.—It is high water, full and change, at the entrance of Hokianga river at 9h. 45m., the tides run from 4 to 5 knots; ordinary springs rise 10 feet, and neaps 7 feet; during strong westerly winds, the neaps rise as high as ordinary springs, and sometimes have been known to rise 4 feet above them. Inside the heads, the velocity of the stream decreases, being from 2 to 3 knots, until in the Narrows, where it is as much as 4 knots. At the anchorage off Kokohu it is high water at 10h. 15m.

The banks of the river are everywhere approachable for boats at high water; at low water the mud-flats, which commence 4 miles from the heads, are of considerable extent, generally soft and very steep-to, and extending from point to point.

On the outer coast the flood runs to the southward, and the ebb to the northward; at the distance of 3 miles off shore the strength is 2 knots, and one knot at twice that distance.

OFF-SHORE SOUNDINGS at 10 miles will be found in about 60 fathoms, green mud and sand, which decrease gradually to 30 fathoms within 3 miles.

The following remarks on the wind, weather, &c., were obtained from Mr. Martin, the pilot, whose experience was gained during a residence of 23 years at the mouth of the river.

WIND.—It blows the hardest and most frequently from north-west to south-west, indeed, the westerly winds are in about the proportion of three to one.

The heaviest gales are from south-west, and occur in the month of June.

Easterly winds are most common in the summer months, and generally draw round by the south; they are looked for at the new moon, and last about 3 days.

The greatest quantity of rain falls in the winter months, July, August, and September.

FOGS, for which Hokianga river has been said to be noted, prevail in October and November, but they seldom last more than 3 hours, from daylight to about 8 a.m.

GENERAL REMARKS.—The longest time a vessel has been detained at the mouth of the river is 16 days, except once, when no vessel could get away for 6 weeks.

There may be about 8 or 9 days in the year when the bar could be crossed without a break.

The greatest number of shipping in the river, at one time, was 7, each averaging 500 tons. The accidents which have occurred during the residence of the pilot here, have been:—one vessel foundered on the north head, two struck on the bar, and a large ship lost her rudder in going out, being set on the south head by the tide, 1854.

Fresh water.—Between the Heads and Young point there are fresh-water streams on either side where vessels may water; the most preferable is a small stream on the north shore, one mile from the north head; here with one boat, H.M.S. *Pandora* procured 26 tons in 2 days. The streams on the opposite shore are occasionally brackish.

Provisions (fresh pork) and vegetables could be obtained in any quantity.

The coast from Hokianga river continues its south-easterly trend, the land is moderately high, and at the distance of 8 miles the coast becomes rocky, with large boulders, and continues so to Monganui bluff. The depth of water 2 miles from the shore is 20 fathoms.

MONGANUI BLUFF.—This remarkable mountain, which is 18 miles from Hokianga, rises immediately over the sea to a height of 2,046 feet, and is thickly wooded; it is a conspicuous landmark, and can be distinguished a long distance from seaward. There is a break in the cliffs for 2 miles southward of it, when they again commence, and extend uninterruptedly in a straight line for 35 miles, or within 8 miles of the north head of Kaipara harbour; these cliffs are topped with sandy hillocks which reach but a short distance inshore, and are backed by a range of moderate height, which extends the whole distance parallel with the coast.

At the foot of the cliffs the whole way from Hokianga to Kaipara, a distance of 64 miles (except at the base of Monganui bluff), is a hard sandy beach.*

Eight miles north-west of Kaipara the sandy cliffs recede inland, leaving an extensive level of sand and swampy ground between them and the beach line; the sand-hills at the north head of Kaipara are 200 feet higher than those along the beach.

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* On this sandy beach, exactly midway between the two ports, the French frigate *Alcmène* ran and was totally wrecked in 1851.

KAIPARA HARBOUR is one of the most extensive inlets in New Zealand. The entrance to it, as is the case with all the ports on the west coast, is attended with difficulties, but when once within, there is perfect security for any number of vessels of the largest size; there is an extent of 700 miles of water frontage inside.*†

Five miles within the heads, three large rivers branch off in different directions, winding through some of the most fertile land in New Zealand, abounding with the kauri and other valuable timber, and well adapted to agricultural purposes. These rivers are navigable for many miles for vessels of large tonnage.

The Wairoa is the northern branch, and rises in the hills on whose northern slope the Waima, an arm of the Hokianga river, has its source; the river extends from its mouth for 30 miles in a north-westerly direction or parallel with the coast, and at a distance of 5 miles from it; it then takes a northerly and easterly direction, and pursues a narrow and tortuous course for an equal distance.

This branch is full of shifting sand-banks, with a channel between for vessels drawing 18 to 19 feet water for a distance of 38 miles, small vessels for 70 miles.

Otamotea, the eastern branch, traverses the whole breadth of the island, one of its arms almost reaching the river Wangari, on the eastern coast, and has deep water for a distance of 25 miles, small vessels go 10 miles farther. Arapaua, a branch of the Otamotea, is a fine deep river up to Matakohae creek.

Kaipara itself, the southern branch, flows through a valley formed by the hills, which bound the coast between Kaipara and Manukau harbours, and is only separated from an inlet of Auckland harbour by a distance of about 3 miles; over this portion of land canoes or whale boats are dragged without difficulty.

The Kaipara district is admitted to be the richest and most extensive agricultural district in the colony. A steamer was in 1869 running regularly to the various settlements on its banks, taking the produce to Auckland.

KAIPARA ENTRANCE.—The entrance of the port, in consequence of there being no distinctive features in the neighbourhood, is not easily made out by a stranger in the offing. The best natural marks for the entrance are, that the sand-hills at the North head, which are 490 feet high,

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* *See* Admiralty plan, Kaipara harbour, No. 2,614; scale, $m = 1 \cdot 0$ inch.

† Information on Kaipara derived from Notices issued by the New Zealand Government, 1877 and 1878; also Brett's New Zealand Pilot, 1880.

200 feet higher than those along the beach, have three green hillocks on their face, which end abruptly in a sand cliff; and that (as has been before observed) the sandy cliffs recede from the beach for some distance to the northward of the entrance.

The land south of Kaipara harbour is also higher than that to the northward, and a large green triangular tuft (Pukitu) will be observed on the summit of a sandy range 430 feet high, 2 miles from the beach line south of the South head which terminates in low sand-hills; moreover in clear weather, the opening shows the dark hills on the eastern shores of the river's mouth, especially mount Waka-huranga, 476 feet high, at the entrance to the Oruawharu river.

A good look-out must be kept from the masthead for the *breakers* on the North spit and South shoals, which will generally be seen long before the distinctions in the land are visible. They extend 5 and 7 miles from their respective heads, and between them is the only navigable channel, the Galatea (North-east or Kemp) channel, by which the barque *Galatea* passed in 1856.

BAR.—The entrance was examined in February 1878, when the least depth on the bar was 5½ fathoms at low-water springs, with 15 fathoms close-to outside, the channel being 1½ miles wide. Inside the bar a depth of 6 to 8 fathoms is maintained for 1¾ miles, when the water gradually deepens to 23 fathoms between Tory shoal—which now forms the north-west part of the southern shoals—and North spit, the channel between narrowing to three-quarters of a mile, with deep water close-to on either side.

Beacons.—On the North head, a little westward of the highest part and close to the edge of the cliff, is the Signalman's house with the signal or semaphore staff—100 feet high—just westward of it; also, a white cone beacon—60 feet high—about 500 yards north-eastward of the signal staff. It must be noticed that these leading marks are not readily distinguishable to the naked eye, owing to the back ground of reddish sand, and they can only be seen from seaward for a distance of 4 or 5 miles.

Directions for entering Galatea channel.—Waka-huranga, a conspicuous conical peak, bearing N.E. ½ E. distant 10 miles from the beacons, open a quarter of a point east of the North Sand head, leads to the entrance of Galatea channel, observing that when Pukitu bears E. by N. a vessel will be near the bar. Before nearing the breakers, bring the middle green hillock on North Sand head to bear N.E. ½ N. and steer for it on that bearing until the beacon and semaphore flagstaff are made out which kept in line N.E. ½ N. is the leading mark through in mid-channel.

Attention must be paid to the semaphore, and the vessel steered in the direction towards which the arm points, and steadying the course when it is dropped; it will not, however, be used so long as the channel is kept. When abreast the low sand-hills at the northern entrance point, keep about 3 cables from the north beach until abreast the signal-station, thence increase the distance to half a mile as far as the pilot-station on Pouto point, where a pilot will board as soon as practicable.

In the event of no pilot being at the station, good anchorage may be obtained about one mile to the northward of Pouto point, in from 5 to 15 fathoms from a quarter to half a mile off shore, abreast a native settlement. Beyond this, a pilot is necessary.

Anchorage in Kaipara branch.—If bound to the southern or Kaipara branches, and not boarded by the pilot before reaching the lower red buoy, which marks the west tail of the Middle bank—lying nearly in mid-channel between the Wairoa and Kaipara rivers and which is generally breaking—pass this buoy and the black one in 3 fathoms, which lies about a mile eastward of it and marking the outer or south-west extreme of Tapora flat, on the port hand, steering towards the South head (a red cliff with cultivation on the top) which may be passed at the distance of 2 cables. Keep the south shore on board, which is high, for about 2½ miles, and anchor in 7 to 9 fathoms off the first projecting point—Kawai point—about half a mile from the shore. Be careful not to proceed above this point any distance, as a bank, with from one to 2 fathoms on it, lies nearly in mid-channel one mile above the point, the lower end of which is marked by a beacon. Abreast this bank is the largest native settlement (Omokoiti) in the Kaipara, and from which place the mud-flats begin to extend; the channel above being formed between banks, which are steep-to, and which, in the absence of a pilot, is best navigated at low water, when they are dry on either side.

A pilot from Pouto point will board a vessel at the anchorage off Kawai point. Beyond this anchorage and that above Pouto point is strictly pilotage waters.

The general course from the anchorage off Omokoiti to Aotea, a remarkable white cliff on the south bank, is S.E. for nearly 8 miles, the channel being one mile wide. When within 2½ miles of the white cliff, the course trends to the southward and the channel narrows.

The anchorage off Aotea is in 7 fathoms, and is the highest and safest in the Kaipara; above this the river branches off into several streams, which flow in a serpentine course to the southward and eastward; one of them reaching within 3 miles of an inlet of the Waitemata river or Auckland harbour.

"The Kaipara river extends 11 miles in a south-east direction from the South head to its junction with Makarau channel; thence in a more southerly direction for about 2 miles to Aotea or Shelly beach, where the channel is half a mile wide, with from 10 to 5 fathoms water close to the point. There is anchorage here with good holding ground. Large vessels should not proceed above this, unless in tow, the water shoaling and the channel narrow and intricate to Helensville, a distance of 14 miles from Shelly beach.

The Makarau channel, leading to the river of the same name, branches off from the Kaipara in a north-east direction. Vessels drawing 14 feet when loaded, can proceed 5 miles up to the loading ground within the river. Large quantities of kauri timber are shipped annually from this place."*

WAIROA BRANCH.—To enter the Wairoa after passing the north spit, keep the north shore on board for 5 miles, until within a mile of Pouto point, the turning point of the river,—which is about 100 feet high with a flat top, where a path has been;—then edge off, as a spit extends half a mile from the shore southward of the point. Having passed the spit, keep the shore on board again, and an anchorage off the watering place will be found in from 13 to 6 fathoms; this anchorage is 2½ miles above Pouto point, and under the second high cliff, after passing a small islet joined to the land at low water, the valley north of the cliff has the stream. From this anchorage a pilot is required.

The Harbour-master at Kaipara has reported (1882) "that the banks in the vicinity of the lower black buoy in the Five-fathom channel, and also in the vicinity of the red-topped beacon abreast of Beacon point, Wairoa river, have changed considerably; masters of vessels therefore are recommended whilst in these localities, to make constant use of the lead, and to give the above-named buoy and beacon a wide berth in passing."

Three miles above the watering place is Okaru, a native village, whence formerly native pilots could be obtained. A monotonous range of white cliffs extend for 17 miles up the Wairoa, which runs nearly parallel with the sea coast at a distance of 5 or 6 miles, until reaching Mongawhare, 28 miles above Okaru village.

Ships took in timber at Mongawhare, where there is sufficient depth of water for any vessel in the trade, and anchorage in 4 fathoms at low water.

From Mongawhare the river runs north-easterly and becomes narrow and tortuous, but timber has been shipped as high as Omano in a vessel of 300 tons. This station, taking the windings of the river, is 21 miles above Mongawhare.

"Large vessels bound up the Wairoa (where at present the principal industry is timber) to the mills, about 35 miles above Pouto point, will require a leading wind; but smaller ones, not exceeding 300 tons, can work the whole distance either way with the tides. There are at present two small steamers, which on application can be had at reasonable rates for towing purposes. Vessels load sawn timber at the wharves, alongside which is a depth of 8 or 9 feet at low water, soft muddy bottom ; those taking in logs usually moor abreast in the river, the deepest water facing Te-kopuru mill, where vessels of 18 feet draught can lie afloat at any time of tide. Vessels requiring refit, &c., can obtain spars, stores and provisions at moderate prices. There are good shipwrights resident, and vessels up to 150 tons have been constructed here. The town of Dargaville is situated above the upper mills, and is with the whole district rapidly increasing in importance. Vessels of 130 tons have loaded 12 miles above Dargaville."*

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* Brett's New Zealand Pilot, 1880.

Mary Catherine bank, with 11 feet water at low-water spring tides, (the depth subject to change,) lies nearly a mile northward of the Middle bank and S.E. 1½ miles from Pouto point, and is reported (1881) to be extending towards the former; its western edge is marked by a red buoy. Masters of vessels bound to the Otamotea, Arapaua and Oruawharu rivers, should be careful to keep the lead going when in this locality, and keep in the deep water towards the Middle bank.

Otamotea.—From the heads of Kaipara harbour there are deep channels into the rivers Otamotea, Oruawharu and Tapora, the eastern branches of the Kaipara: the channels lie between sand and mud banks, and until buoyed should not be taken without a pilot. The two first-mentioned rivers have undoubted advantages over the other branches of the Kaipara, being near the heads, free from banks, and their shores comparatively free from mud-flats, with fine soil and abundance of timber; their sources also being within a short distance of Wangari river on the east coast, will eventually make them the most valuable branches of this great estuary.

"The Otamotea river penetrates a long way into the interior in a northerly and easterly direction, to within a few miles of the head waters of the East coast rivers, and is navigable for vessels of 500 tons; the least depth is 4 fathoms at low water. There are extensive forests at its head, and the adoining district is chiefly grazing and agricultural.

"The Arapaua river branches off to the north-westward from the Otamotea about 4 miles above its entrance, and is navigable with a deep and straight channel for 5 miles for vessels of any size, having a depth of 6 to 9 fathoms; the district presents the same features as the Otamotea. The township of Batley is situated at the junction of these rivers. Steamers ply on the Wairoa, Otamotea and Arapaua, bi-weekly to Helensville at the head of the Kaipara branch, which is connected with Auckland by rail.

"The Oruawharu river lies south-east of the entrance to the Otamotea, navigable about 6 miles for large vessels, and for coasters about 10 miles higher up to the sawmills at Tapuni. The Albertland settlement is on the south-eastern side of the river, with the town of port Albert 10 miles from the entrance.

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* Brett's New Zealand Pilot, 1880.

"The Tapora channel entrance lies northward of the South head, whence it trends E. by N. 8 miles with an average width of half a mile, carrying a depth of 7 fathoms to Orongo point, where it shoals to 4 fathoms. Large vessels should not proceed more than one mile above this to Te-karaka point.* Hence the river takes a northerly direction, and becomes narrow, only fit for small vessels of 20 or 30 tons. The district at the head of this river joins the port Albert settlement, and has large kauri forests."†

TIDES.—It is high water, full and change, at Kaipara harbour entrance at 10h. 55m.; springs rise 10 feet, and neaps 8 feet. The tides vary in strength according to winds and freshes: they are strongest in Galatea channel between the Tory shoal and North spit, and off the north shore, until reaching the first white cliffs in the Wairoa, when the influence of the Otamotea and Oruawharu rivers may be said to cease: the ordinary springs in these parts run 5 knots, but during freshes and strong gales 6 and even 7 knots.

Both ebb and flood streams set slightly towards the north shore of the Galatea channel, great care should therefore be exercised when beating, or in light winds.

In the Kaipara branch, up to the first anchorage, the springs run 3 knots, above that not more than 2. In the upper parts of the Wairoa above the watering place the stream runs 3 knots, and continues at that strength until near the head of the river. The tides of the river follow the courses of the channels.

Bore.—Above Mongawhare a bore of considerable strength carries up the first of the flood, breaking upon the north bank. It is high water under Toka-toka, (a remarkable sharp peak, 620 feet high on the east bank of the river, and 9 miles below Mongawhare,) at 12h. 23m.; and at Omano, the highest distance ships can go, at 2h. 30m.

The tides outside the harbour follow the direction of the coast, the flood running south and the ebb north, but on striking the outer banks they flow and ebb directly over them, as well as through the channel. This set of the tides must be attended to in navigating the channel, and a vessel should not stand far into the great semicircular bight inside the banks with the ebb, or she will be carried on them. Unless in cases of emergency vessels should not anchor outside the heads.

Vessels anchored above Pouto point can easily beat out with a good working breeze, and obtain a good offing in one tide by starting at slack high water or the beginning of the ebb. The best tides for this are when it is high water about 10 or 11 o'clock, as the sea breeze will then have set in.

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* The barque *Mary Mildred*, in proceeding above this point, was recently wrecked on a rock, with 6 feet water, in the channel abreast the islet lying half a mile above Te-karaka point.—*Marine Department*, Wellington, May 1883.

† Brett's New Zealand Pilot, 1880.

Caution.—If a fair wind is considered necessary, it must be remembered that the morning land wind will rarely carry a vessel clear of danger, and will probably leave her becalmed among the breakers.*

"Masters of vessels should be careful in entering or leaving port with light winds, as they sometimes fail when most required, and the strong tides invariably set a vessel on the North spit, if the anchor is not let go in time. With a commanding breeze there is no danger, if the leading marks are kept on."†

From KAIPARA to MANUKAU HARBOUR, a distance of 40 miles, is almost a straight coast and free from dangers, but no landing can be effected on any part of it. Rangitera beach, a hard sand fringed with low undulating sand-hills, extends 24 miles south of Kaipara; and behind these, about 2 miles inland, a range of barren hills, many of them with sandy tops and faces, runs parallel with the coast the same distance, the highest of them not exceeding 550 feet.

The small island Oaia lies at the southern end of this beach, about half a mile off shore, hence to Manukau harbour the coast is rugged and cliffy, broken here and there into sandy bays and beaches, the land rising gradually towards the north head. The cliffs for 5 miles northward of the entrance are from 600 to 800 feet high, and 2 miles from the north head is a remarkable conical peak (Ohako) close to the sea. 1¾ miles north-west of Ohako cone is Parera, a small rock, lying 1½ cables off shore. The coast immediately southward of Parera is fronted by a shoal, which extends one mile off and is continually breaking. The north head itself is a remarkable cone, and has two others inside it at distances of half a mile from each other.

Vessels running along the coast from the northward for Manukau, should keep not less than 4 miles off shore, as the banks and bar extend 3½ miles off the mouth of the harbour.

MANUKAU HARBOUR.—This extensive inlet, immediately opposite to Auckland harbour, and affording water communication within a short distance of that town, is of considerable importance, as by its means Auckland enjoys rapid communication with Taranaki, Wellington, Nelson, and all the ports on the western seaboard.‡§

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* A ship, with some lives, was lost by not attending to this caution of the land wind failing, and leaving a vessel becalmed among the breakers.—Letter from Commander Drury, Jan. 7th, 1856.

† Brett's New Zealand Pilot, 1880.

‡ *See* Admiralty plan, Manukau harbour, No. 2,726; scale, $m = 1 \cdot 5$ inches.

§ Information on the Manukau bar and harbour is derived from the Remark book of Navigating Lieutenant H. S. Penn, R.N., H.M.S. *Sappho*, 1876; also Notice issued by the New Zealand Government, 1878.

CAUTION.—Since the survey by Captain Drury, R.N., in 1853, it has been found that the Entrance channels into Manukau harbour also the banks have completely changed, and attention is here directed to the fact that the main channel, formerly so called, is no longer used.*

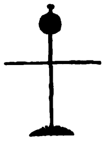
Situated, as Manukau harbour is, on an open and exposed coast, with a shifting bar at the entrance of its principal channel, at the distance of 3¼ miles from the land, the harbour has so many dangers obstructing its several channels, as to make it imperatively necessary for attention being paid to the latest local directions, and the greatest precaution being observed by the mariner.

Although there does not appear to be less than 2¼ fathoms at low-water springs in the South channel, no one unless thoroughly acquainted with the local signals should attempt to enter Manukau harbour without a pilot.

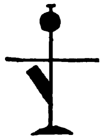
The banks being subject to constant change and the buoys frequently adrift,† masters of vessels must exercise the greatest caution in approaching the harbour, and pay close attention to the steering signals from the pilot station, situated on the South head, keeping the lead constantly going.

Signals.—The following local signals for Manukau harbour were approved by the New Zealand Government in December 1873, and supersede those formerly in use.

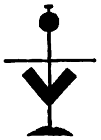
1. One ball at mast-head—*Wait for flood tide.*



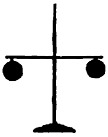
2. One ball at mast-head, and north semaphore arm pointed up—*Wait for half flood.*



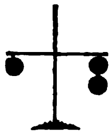
3. One ball at mast-head, with both semaphore arms pointed up—*Wait for high water.*



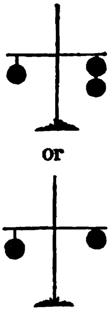
4. One ball at each yard-arm—*Steam vessel take South channel.*



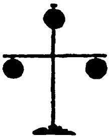
5. Two balls vertical at south yard-arm, and one at north yard-arm — *Sailing vessel, take South channel.*



6. When the ball at north yard-arm is lowered half-way down in connection with signal for steam or sailing vessel, it will mean—*Take Fanny channel.*



7. One ball at mast-head, and at each yard-arm — *Bar dangerous.*



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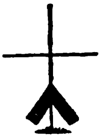
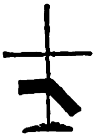
* H.M.S. *Orpheus* was totally wrecked on the bar in February 1863.

† The buoys off the South head have been removed.

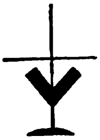
8. Both semaphore arms pointed down — *No wind about the heads.*



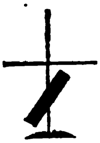
9. North semaphore arm pointed horizontally, and south arm downwards—*Come to an anchor.*



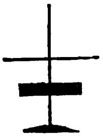
10. Both semaphore arms pointed upwards—*Remain at anchor*, or *Wait for signal.*



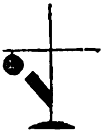
11. South semaphore arm pointed upwards, and north arm downwards—*Will send a pilot.*



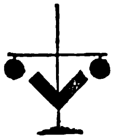
12. Both semaphore arms pointed horizontally—*Get under weigh.*



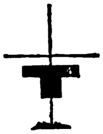
13. North semaphore arm pointed up, and one ball at north yard-arm—*A vessel in danger and wanting assistance.*



14. Both semaphore arms pointed up, and a ball at each yard-arm.—*A steamer is coming to your assistance.*



15. When the signals are intended for vessels OUTWARD BOUND, an *extra signal* in the form of T, painted *red*, will be shown below the yard on the mast.



16. The semaphore arms will be used for piloting vessels in and out of the harbour when required. The vessel being piloted by the semaphore is to be steered in the direction in which the semaphore arm is pointed; and when the arm is dropped, the vessel is to be kept steady as she goes.

NOTE.—*The illustrations are shown as they will appear from seaward.*

Entrance.—The heads are easily distinguished, the coast gradually increasing in elevation from Kaipara to Manukau, where the hills on the north shore rise to the height of 1,300 feet. To the north of the port the country is an extensive forest, while all that facing seaward to the southward is peculiarly barren for 20 miles; but the most conspicuous objects first visible from the westward are three conical peaks near the North head. One of them forms the island Paratutai, and may be considered as the North head, being connected by a causeway; it is 335 feet above the sea. At 1¼ miles from it, inside the harbour, on the side of the hill, are three beacons, which are leading marks for the South channel (formerly known as the Fanny channel). The South head presents a rounded barren face of brown soil, with table-land extending southward.

LIGHT.—On the brow of the South head bluff, from a tower 20 feet high, a *fixed* white light is exhibited at an elevation of 385 feet above the level of the sea, visible from seaward between the bearings of N. by W. ¼ W. and E. by S. ½ S., and should be seen in clear weather from a distance of 26 miles.

The lighthouse is nearly of the same colour as the surrounding land; it cannot, however, be mistaken for a beacon, as the beacons are painted white.

Caution.—Although the light may be seen from a long distance seaward in clear weather, its limit of visibility will be much smaller in thick weather, and great care should be taken in approaching the shoals, which extend so far from Manukau entrance.

THE BAR of the main channel, a cable in breadth, is 3¾ miles from Paratutai; the least water at low-water springs is 21 feet in the channel on the bar.

The soundings from seaward to the bar decrease very gradually to 12 fathoms, which will be found on the outer edge; and from that depth it shoals suddenly, increasing again within from 7 to 17 fathoms.

The natural marks for leading into Manukau harbour are very conspicuous; but from the shifting nature of all the bar harbours on the West coast of the North island, the seaman is *cautioned* to pay strict attention to directions that may be given from the Pilot station, and it has been recommended as a general rule, in the absence of direct information of change in the channels, that that portion which has the smoothest water between the breakers should be taken, as experience has proved that it will be the deepest part.

The leading mark used in 1864 was the Nine-pin rock, in line with the tangent of the inner point of the South head, but as there is the same depth, viz.—3½ fathoms a little to the northward, and the banks have a tendency to extend themselves yet more in that direction, it would be better to bring the Nine-pin rock in line either with a projection, half way up the slope (Nib), or with the inner part of the Sand-cliff on South head, for crossing the Bar.

When inside the South spit or outer Middle bank bring Puponga point open of Paratutai, steering along the Middle banks to avoid the Orwell shoal, which runs about 1¼ miles S.W. by W. from the Nine-pin. The dangers are plainly seen on both sides of the channel, except at high water, during a long continuation of fine easterly weather.

Paratutai may be passed as near as convenient; the navigable channel between it and Emma shoal (the eastern of the Middle banks) is half a mile wide, and steep-to on either side.

Entrance channels.—In February 1878, there were two channels from seaward into Manukau harbour, known as Main and South channels; the former is the only channel a large vessel could enter by, but the South channel (formerly known as the Fanny channel) is the only one used. It often happens in ordinary weather at sea, that when the Bar and Middle banks break heavily, the water is smooth in the South channel.

The least water in South channel is 2¼ fathoms, the tidal streams are strong and the channel shifts after strong south-west gales.

Directions for South channel.—When approaching from seaward, a vessel should steer as directed by the semaphore arm, until the three white beacons (43 feet high) on the north side of the entrance are brought in line; the course must then be sharply altered and care taken to keep them in line until the harbour is well open, to clear the South head spit and Emma shoal. The pilot, if necessary, will board inside the entrance.

The beacons on South head no longer serve as a leading mark for the deepest water in the South channel. Vessels must therefore pay attention to the semaphore alone.* This channel is the only one for which signals are made.

The South head is one mile inside the North head; a spit extends from the former towards Paratutai for a quarter of a mile; there is a depth of 7 feet on the end of this spit.

After passing this spit the channel is clear to Puponga, a distance of 4 miles, the depth gradually decreasing from 20 fathoms; it is not advisable to anchor until rounding this point on the north shore, or Mako point, which is nearly opposite it on the south side; but if necessary, the Huia banks afford anchorage in from 5 to 6 fathoms, nearly 2 miles before reaching Puponga. There is shoal water extending off the Huia one mile to the westward of Puponga point, but by keeping the Nine-pin open of Paratutai the outer edge of it will be cleared.

After rounding Puponga point, vessels bound up the northern or Wairopa channel should haul up to avoid the tail of the mud-flats,—marked by red buoys,—between which and Puponga there is a channel of scarcely half a mile; good anchorage will then be found in 4 fathoms, half a mile above the point, and about a third of a mile off shore. With a leading wind vessels can proceed as far as Shag point, 4½ miles above Puponga, leaving the red buoys on the starboard hand, the channel being a third of a mile wide, and the course along the coast, taking care not to get within the line of the points.

Vessels going to Papakura or Waiuku should proceed to an anchorage, off Kauri point, in from 8 to 10 fathoms. The course to this anchorage, which is little more than 2 miles from Mako point, is, after passing the latter, to keep the shore on board within a third of a mile, to avoid the flats which dry at low water. Should a vessel arrive off Paratutai and be unable to obtain a pilot, the best place to anchor is half a mile above Puponga point, where she would be seen from Onehunga and a pilot would come down. No vessel of more than 15 feet draught should go above Shag point without mooring head and stern. The best place is about a quarter of a mile below the White cliff in 18 feet low springs.

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* See paragraph 16 of Signal instructions, p. 219.

TIDES.—It is high water, full and change, at the entrance of Manukau harbour at 9h. 30m.; springs rise 13 feet, and neaps 10 feet. Tides above Puponga, both in the Wairopa and Waiuku channels, average 2½ knots at springs. In the narrow part of the channel off Paratutai they run 4 knots, and on the bar outside from one to 2 knots; on the outer coast the flood sets to the south, and the ebb to the north. The tides within take the direction of the channels, and are not strong on the banks even when well covered, which is a good guide for navigation.

The following remarks are by Mr. Wing, pilot and harbour-master, made during an experience of over a quarter of a century:

"Care should be taken to guard against the cross-tides about the spits and swatchways.

"The prevailing winds are from north-west to south-west, and it seldom blows a gale from the southward—the wind moderating as it draws from south-west towards south.

"Easterly gales are not frequent, and generally shift suddenly to N.W., in a violent squall with very heavy rain, working to the westward with a rising barometer.

"The gales rarely continue long in one quarter, and a strong breeze from north-west or even W.S.W. (as a rule) does not cause a heavy sea in the South channel, which can be taken with safety towards high water.

"The Bar, with such winds, generally speaking, breaks, and dangerously, towards low water; but in case the gale gets to the south-west the sea will break right across both channels, but less across the South channel, which is never at any time so dangerous as the Main channel. This, however, is of short duration, and seldom lasts over a day and a night, when by the morning it becomes moderate, and the South channel free of break (even though there be considerable swell outside and the banks breaking heavily), and safe to enter at proper time of tide, say at half-flood, or even at first-quarter ebb, with a commanding breeze or steam.

"A falling barometer indicates a change to the north with rain; but when it rises above 30 inches (say about 30·30 in.), and the land appears nearer than usual, expect a change to the eastward. A clear cloudless night also is an indication of a change being at hand, and if accompanied with heavy dew, the change will in most cases come from the north-east quarter, but when lightning is seen to the westward, in dark cloudy weather, a blow may be expected from about S.W."

INNER WATERS of MANUKAU HARBOUR.—From the Puponga peninsula, Manukau harbour expands to a breadth of

15 miles by 12, having three channels navigable for vessels of any tonnage to three equi-distant and valuable districts (viz.), Onehunga, Papakura, and Waiuku.

These channels are with slight exceptions nearly straight, and having dry banks on either side at low water, they offer a sheltered anchorage in any part; they carry their depth up to within the heads of Waiuku and Papakura, and nearly up to Onehunga.

There are also two deep channels leading along the north shore; one branching off the Onehunga middle channel (*Wairopa*) at Shag point, leads to the Wahau portage, and joins the Middle channel again just before reaching cape Horn, though at this point it is only navigable for vessels of burthen at high water.

The other, outer Onehunga channel (*Purakau*), runs up direct from Puponga point, and would have been the best channel to Onehunga, but that it fails in depth where it enters the Middle channel, at cape Horn; it is useful to the lands around Puketutu, and indeed is generally available, as it would have 22 feet at high water, where it is most difficult. The general nature of the bottom in all these channels is a greenish sand and mud, good holding ground. The tides within them average at springs 2¼ knots; there are no rocks and no uneven ground, and the banks, being soft sand and shells, are not likely to injure a vessel on touching.

One tide will suffice to carry a vessel from the heads, with a leading wind, to either of the above districts.

It will be observed that these remarks are suited for vessels of any burthen, but the Manukau flats can be traversed by boats, according to the tides, and, unlike the banks outside, there is the smoothest water over them, the tide taking the course of the channels. The banks are generally covered soon after the first-quarter flood, but they vary in height; and some are never uncovered, especially those facing the Waiuku channel, where there is generally 4 feet at low water, and only small spots that dry. Having made these general observations on the different channels, we now come to their more immediate description.

Onehunga middle or Main channel leads along the north shore from Puponga point; a flat extends from the village of Karangahapi, which lies in the bight, 1¼ miles north of Puponga, off which there is good anchorage.

From Karangahapi there is a straight channel to Shag point (*Okewha*) one-third of a mile broad, with 4¼ fathoms at low water.

At Shag point the channel divides, the inner one along the coast has a depth of 3 fathoms near the Wahau portage, but as before mentioned difficult at cape Horn.

The main channel takes an easterly direction from the buoy off Shag point to the next buoy, thence turning in again towards cape Horn ; its width is little more than a cable, with from 3 to 4 fathoms at low water; at the junction of the three branches near that cape, the least water is 13 feet. The southern edge of the channel here is well marked by beacons.

Cape Horn (*Matengahe*) 2¾ miles below Onehunga, is steep-to. The anchorage above it is wider than that immediately off the lower end of Onehunga, where there is, however, a pool of 3 fathoms at low water. The general anchorage would be about a quarter of a mile below the White cliff (*Tetapere*), in 18 feet at low water, where vessels should moor.

ONEHUNGA is a port of entry about 6 miles south of Auckland by land, and has a large population. There is a fine level macadamised road, bordered by substantially fenced farms, handsome suburban villas, and market gardens, leading from Auckland to Onehunga. The railway from Auckland to the Waikato country passes this town, which is pleasantly situated on a gently rising slope from the beach, and promises to become, having extensive wharf accommodation (1880), a very important commercial and shipping port, as it is found that steamers can reach Sydney or Melbourne in a shorter time, sailing from the Manukau than from Auckland, or any of the southern ports, and having in its vicinity iron-sand, ironstone, and coal in great abundance. The facilities afforded by the railway, which runs to the wharf, will rapidly increase the business and manufactures of Onehunga.

The shore up to Onehunga is generally formed by low perpendicular cliffs: there are two broad creeks of no depth, besides several smaller streams in the various bights. The points are of soft grey level sandstone, extending in straight layers from the points to the south-west, but in some instances takes a curvilinear form. Karangahapi bay has deep iron-sand.

Purakau or the outer Onehunga channel runs, as before observed, from Puponga point, between the banks, straight for Puketutu island. It has an average width of a quarter of a mile, and carries from 6 to 7 fathoms at low water to within three-quarters of a mile of that island. It then takes a direction for cape Horn, and becomes narrower and somewhat intricate: at its junction with the Middle channel at that point, is a depth of only 9 feet at low water.

Papakura channel, cutting through the middle of the flats, runs to the eastward for 12 miles; it has from 8 to 10 fathoms for the first 3 miles, and not less than 4 fathoms to within the heads, where there is anchorage in 4½ fathoms.*

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* Extensive coal-fields have been discovered at this head of this channel, which the intercolonial steam vessels avail themselves of.

The Whatapaka creek falls into this channel from the southward, 4 miles from the entrance, having from 3 to 4 fathoms for 2 miles up, when it becomes narrow and winding, with half a fathom to its head.

Another creek, Pukaki, joins 2 miles above this from the northward, having a good boat channel.

Waiuku channel, commencing from Te-hono point, opposite to Puponga, runs along the shore to the southward. For 6 miles to the heads (Karaka and Tokaroa points) there is a depth from 5 to 8 fathoms water until nearing these points, when the depth decreases to 4 fathoms.*

The channel leads close to Karaka point, a reef and bank extending a considerable distance off the opposite point: there is a hole of 17 fathoms between, and 6 fathoms after passing them, in which depth there is anchorage one mile within.

Above Karaka point the river runs to the south-east, and vessels drawing 12 feet may go up as far as the narrows, which are 4½ miles above that point.

The Taihiki, a tributary of the Waiuku, one mile within Karaka point, is navigable for vessels drawing 12 feet for 2 miles. The channel up to Waiuku is along the coast, and it is generally steep from point to point.

COAST from MANUKAU to WAIKATO RIVER, a distance of 23 miles in a south-east direction, is a sandy beach, with barren-looking table-land facing seaward.†

WAIKATO RIVER is one of the largest rivers in New Zealand; its takes its rise about the centre of the island in Tongariro mountain, and has several branches, the principal of which is the Waipa. It has a shifting bar, and is only accessible to small vessels; it is said to be navigable for vessels of 30 tons for 60 or 70 miles, and for a much greater distance for boats; there are 3½ fathoms at low water, within the entrance. The north entrance point is composed of sand-hills, while the land on the south side is bold, rising from 500 to 600 feet; a mountain 1,230 feet high (*Teruatuitui*) lies N.E. by E. 4½ miles from the entrance.

Beacons.—Two white beacons have been erected on the north bank, they are 25 feet high and a quarter of a mile apart; when in line, they lead over the deepest part of the bar.

Directions.—When near the Waikato do not shut in Oruaranghi point (a point 3 miles southward of the entrance) until the Fairway beacons are in one, bearing N.E. by E. ½ E. (easterly); then proceed over the bar with them in line. When just over the bar, the water will deepen 5 or 6 feet; keep the marks on until a sandy cliff on the South head is about to shut in, when steer for Putataka. When the Mission-house is touching a yellow cliff on the west side of Putataka, see that the small black beacons on the north entrance shore are still open, to avoid the 5-feet bank lying northward of the channel.

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* A pinnacle rock is said to exist midway between Karaka and the opposite shore of the channel, but we searched for it in vain.—Remarks by Captain Drury, R.N.

† *See* Admiralty coast chart, sheet VI., Manukau harbour to cape Egmont (plans, New Plymouth, Aotea, and Waikato river), No. 2,535; scale, *m* = 0·25 of an inch.

If wishing to bring up to the eastward of Putataka, anchor so as to swing clear of a 4-feet rock, E. by N., one cable from the point, and the shoal water northward of the channel. If the vessel is 150 feet long, she must moor, but can lie at single anchor to the north-west of the point. The tide is less strong to the eastward of the point.

In going out from Putataka, steer for the mouth of the river, keeping the black beacons open to avoid the 5-feet bank.

Bring the Fairway beacons in line when the sandy cliff is about to open itself, and proceed across the bar. Keep the marks on until Oruaranghi point is well open, which will clear the breakers at the entrance.

The least water on the bar, with the Fairway beacons in line, is 12½ feet at low-water spring tides; but there is a depth of 10 feet a short distance to the northward, and 11 feet the same distance southward, so that the marks should not be opened much.

The beacons when in line appear on with the middle of an easily recognized gully. The eastern beacon is on White shell summit; the western beacon a quarter of a mile S.W. by W. ½ W. from it on a little mound.

The spits at the entrance appear to have shifted since Captain Drury surveyed the Waikato.

Tides.—It is high water, full and change, on the bar of Waikato river at 9h. 30m.; springs rise 12 feet, and neaps 9 feet.

The stream runs 4 knots in the entrance, and 2½ knots above Putataka.

Townships, etc.—The town of Mercer at point Russell is about 25 miles from the entrance. Here the railroad from Auckland passes close by the river banks and on to Ngaruawahia (Newcastle), where it crosses the river over a substantial bridge, and on to Hamilton, &c., southward. At Ngaruawahia the river divides, one branch, the Horatiu, running past Hamilton and Cambridge; the other—the Waipa—past Alexandra. Steamers ply between Mercer and these towns.

Coal.—The coal mines near the banks of the river at Taupiri, about 20 miles above Mercer, are being rapidly developed, aided by the railway communication with the Manukau and Auckland.

" Taupiri Coal-mining Company, Waikato, is 65 miles from Auckland by rail. The present output is 1,500 tons per month; but 6,000 tons per month could readily be produced if required. The Company are now working a seam of coal 40 feet thick, and have an unlimited supply for 20 years. The coal can be delivered in Auckland at from 15*s.* to 18*s.* per ton.

"Waikato Coal-mining Company, is about the same distance from Auckland by rail as the Taupiri mine. The present average output is 1,600 tons per month; could deliver 600 tons per day if required. Are now working on seam of coal 23 feet thick. The quality of this coal for steam purposes is highly spoken of by the officers of several steam-ship companies who have used it exclusively."*

The COAST.—From Waikato river the coast trends S.S.E. ¾ E. for 22 miles to Whaingaroa harbour; the only off-lying danger is the Kapiapia rock, a black rock about 20 feet high, lying one mile off the coast, 8 miles southward of the south head of Waikato. The points are generally cliffy, with scattered rocks extending about a quarter of a mile off them, and sandy beaches between.

The land is moderately high and undulating, being from 300 to 600 feet above the sea.

Soundings.—The soundings on this part of the coast are, at the distance of 10 miles, 28 fathoms, gray sand, shoaling gradually to 16 fathoms within 4 miles of the beach.

WHAINGAROA HARBOUR (or port Raglan, from a town of that name established on its southern shore,) may be known by Karehoe mountain, of conical shape, rising immediately over Woody head, the outer south entrance head, to a height of 2,370 feet; it is an excellent landmark.†

The harbour is just northward of the mountain, in a bight formed between it and the land running towards Waikato. When the bight is made, the entrance will be distinguished by a reddish cliff hill (*Te-koko*) over the south head; the north head is low and sandy, with high wooded land behind; the south point is also low, but not sandy, and slopes down from the reddish cliff hill just mentioned.

The bar is a mile outside the entrance, which is formed by two spits dry nearly half-way out at low water, the passage between them being 2 cables wide; the marks for crossing it were, in 1866, a large white house in the town, its own breadth open of Rangitoto point, or the two beacons on Ann point in line, which lead in on an E.N.E. course over the bar in 3 fathoms at high water. Ann point gradually slopes from a low hill 1⅔ miles inside the entrance points.‡

The beacons, painted red, one higher than the other, are posts with barrels on them.

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* Nautical Magazine, November 1880.

† *See* Admiralty plan, Whaingaroa harbour, No. 2,534; scale, $m = 4·0$ inches.

‡ Commander Fremantle, R.N., 1866.

Caution.—Owing to the shifting nature of the bar, it must be approached with caution by strangers.

Soundings.—In approaching Whaingaroa, the water shoals regularly from 8 fathoms, 2 miles off, to 9 feet, which is the least depth on the bar at low-water springs: the channel is straight in from the bar to the heads, carrying in 2, 3, 4, and 5 fathoms when between them. Vessels may sail up to where the harbour branches off into the Whaingaroa and Waite-tuna rivers, which are 3 miles from the entrance.*

A course rather to the northward of mid-channel should be steered until nearly abreast Ann point, when a vessel should haul over slightly towards the south shore, to avoid a shoal which extends from the north side between Mata-whero and Mata-kokaku points.

Anchorage.—There is good anchorage off Mata-kokaku point, above the greatest strength of the tides; indeed a vessel may anchor in any part of the harbour. Small vessels generally anchor off the first limestone rocks above the north head, near Hoie village, in 9 fathoms. One mile inside the entrance of Tureruа creek, on the south side, is a Wesleyan Mission-station.

Tides.—It is high water, full and change, on the bar of Whaingaroa harbour at 9h. 50m.; springs rise 12 feet.

The strength of the tides between the heads is from 4 to 6 knots; a mile above, from 2½ to 3 knots; and at the anchorage off Mata-kokaku point, from 1½ to 2 knots.

GANNET ISLAND (*Karewha*), a small island about half a mile in circumference, white with guano, and 70 feet high, with rocks extending a quarter of a mile south-west of it, bears S.W. ⅝ S. 14 miles from Woody head, and N.W. ¼ W. 11¼ miles from Albatross point; there are 30 fathoms water at the distance of one mile all round, and 20 fathoms midway between it and the coast; it is generally covered with gannets.

AOTEA HARBOUR.—From Woody head the coast trends nearly south; the country hilly and wooded. Aotea harbour lies 10½ miles to the southward of Woody head, and 9 miles N.N.E. of Albatross point; the entrance is also 12 miles east of Gannet island.†

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* This anchorage is much more considerable than Kawhia, and I consider the harbour better and easier of access. The bar is quite straight, and practically has as much water over it as the Kawhia bar. From the 21st April to 3rd May the bar was breaking dangerously, owing to south-west gales.—Remarks by Commander Fremantle, H.M.S. *Eclipse*, 1866.

† *See* plan on Admiralty coast chart, Manukau harbour to cape Egmont, sheet VI., No. 2,535.

On approaching it from seaward the entrance, three-quarters of a mile wide, has the appearance of a great gap, with sand-hills on either side; the south point, Kapua-te-mauna, has a darker summit than the rest of the hills on the coast, and is 385 feet high; the north head is a low point, 44 feet in height, formed by the gradual slope of the sand-hills.

Outlying rocks.—Off the north head, one mile from the land, are two rocks; the northern (*Ewhatu*) is awash at low water, and nearly always breaking; it bears from the north head W. by N., and from the bar N.W. by N. 1½ miles from either. The south rock, which seldom breaks, is 3 cables S. by E. of Ewhatu; there is deep water around and between them.

The BAR.*—From the north head a long sand spit, dry at half-tide, runs to the southward for one mile; and three-quarters of a mile southward of the south head the south spit runs off, and outlies the north one, drying at low water about one-third of a mile out.

Directions.—In steering for the bar, two small triangular patches of yellow cliff to the right of the south point will be seen; the right of these patches in line with where the summit of the dark hill over the south head meets the sand-hill, or where they appear to join, bearing E. ¾ N., leads over the bar in 11 feet at low water. After crossing the bar, which is about a cable in width, haul in along the spit E.S.E. until abreast the tail of the north spit, which always shows, then gradually haul up, keeping the north spit on board, to the north head; still keep the north shore on board at 1½ cables distance, as there is an extensive sand-flat on the south shore.

When abreast Punga-punga point, edge over to the southward half a cable, to avoid a tongue with 4 feet on it; and when abreast the abrupt termination of the sand on the north shore, steer for the Red cliffs on the south side, and anchor off them in from 4 to 6 fathoms.

The depth of water in the channel from the heads to Punga-punga point is from 2 to 4 fathoms at low water; it continues to the eastward three-quarters of a mile towards the Red cliffs, when it turns to the northward, and divides into three small channels, the westernmost leading to the Mission-station, above which it is dry; the middle towards Pakaka creek, dry at low water; and the eastern channel to Makamaka creek, also dry at low water.

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* It must be observed that this description of the bar and channels resulted from the survey made by Commander Drury in 1854; but as there is reason to believe that river freshes and westerly gales tend to vary the conformation of the spits and the depth of the channels, it is advisable to pilot vessels from aloft; and it has been recommended that telegraphic arrangements, similar to those existing at Manukau and Hokianga, should be established at all the ports southward of the former harbour.

Tides.—It is high water, full and change, on the bar of Aotea harbour at 10h.; springs rise 12 feet, and neaps 9 feet. Between the heads the tides run from 3 to 5 knots, and at the anchorage off the Red cliffs from 2 to 4 knots.

KAWHIA HARBOUR, 5 miles south of Aotea harbour, is the most considerable inlet on the west coast south of Manukau harbour.*

The approach is well marked from seaward by the distant mountains of Pironghia, which rise in notched summits, 15 miles inland, to the height of 2,800 feet, also by the high wooded headland (Woody head) to the northward, and by the bold craggy land of Albatross point on the south side, which extends 5 miles S.W. by W. of the port and forms the bight in which it lies.

The harbour bears from Gannet island E. by S. ¾ S. 13 miles distant. It has a bar entrance, which is 1¼ miles distant W.N.W. from the heads. There are two channels in,—the north and south,—separated from each other by a bank nearly half a mile in extent, with less than a fathom on it at low water.

The South channel is the best and deepest, being nearly 2 cables wide, with 14 feet in it at low water; the northern is not so wide, and only carries 11 feet over it; moreover, in westerly winds, there is a heavy beam sea in crossing it.†

The South head is double, forming two distinct cliffy points a quarter of a mile apart, with a sandy bight between; rocks extend off both, visible, and not detached: the inner head, which appears as and is called the South head, is 110 feet high, with a very conspicuous yellow patch on it. The North head is a low sandy point, the termination of the sand-hills which stretch the whole distance between Aotea and this harbour.

South channel.—In approaching from the westward, steer for the Pironghia mountains until Albatross point shuts in the land to the southward, which will be about 5 miles from the shore. Then to enter the South channel, bring the South head to bear E.S.E., and steer for it until the leading mark inside becomes visible on the same bearing: this mark is an arched cliff of a reddish colour and dotted with trees, 3 miles within this entrance. Keep this cliff a little open of the rock off the South head, bearing E. by S. ¾ S., and steer in on that course with these marks on: or as this cliff is now concealed by the growth of shrubs, the best mark is (1866) to keep a nearly square white cliff (a little to the southward of the arched cliff) in the gap between the South head and the large rock off it, which will lead in on the same bearing, the water will be found to shoal gradually from 10 fathoms one mile outside the bar to 14 feet at low water when on it.

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* *See* Admiralty plan of Kawhia harbour, No. 2,524; scale, $m = 3 \cdot 0$ inches.

† *See* foot note, page 229.

When this latter depth is obtained, haul up towards the North sandy head to avoid the south bank, which the channel leads rather close to; and having run 3 cables there will be 3½ fathoms, when steer direct between the heads E. by S. ½ S. until 2 cables within the inner South head, or until the outer South head is just open of the extreme of the rocks off the inner head; then haul up the left channel, steering E.N.E. towards Leathart point.

The channel, which for the first mile is between sand-banks, is little more than a cable wide, with 4 and 5 fathoms; the banks have only 2 or 3 feet on them at low water, and will be distinguished by the stream. After passing them, which will be half a mile before reaching Leathart point, steer for that point; there are 6 fathoms within half a cable of it; anchor half a mile above, a cable off shore, in 4 fathoms, abreast the native church.

North channel.—The marks for crossing the bar by the North channel are, the houses at Takatahe, Ohaua point, (2½ miles within the entrance,) just open of the rock off the South head, bearing S.E. ½ E.; steer in with these marks until in deep water,—5 or 6 fathoms,—or until within 3 cables of the heads, when keep between them, and the same directions previously given will hold good. There is anchorage in the southern arm for small vessels, by rounding the South head at the distance of less than a cable, and keeping along the south shore for about half a mile.

When within Kawhia harbour, and the flats are covered, the harbour presents a considerable expanse of water, 6 miles in length by 4 miles in width; but when the tide is out, the channels leading to the rivers Oparau, Kauri and Awaroa, Rakau-nui, and Wai-haerekeke are all plainly visible, and easily navigable for small vessels for a considerable distance.

TIDES.—It is high water, full and change, on the bar of Kawhia harbour at 9h. 30m.; springs rise 12 feet. The strength of the tides between the heads is from 4 to 6 knots; within, from 2 to 4 knots: the ebb tide sets over on the south bank, with a slight inclination to the southward, and the flood in the contrary direction.

In the bay between the south head of Kawhia and Albatross point, there is anchorage in 4 to 8 fathoms, sandy bottom, in fine weather with off-shore winds.

COAST SOUTHWARD of KAWHIA.—Albatross point is 600 feet high, bare and cliffy to seaward, having detached rocks within a cable; during south-west winds, and with the ebb tide, there is a great sea off this point, and vessels bound to or from Kawhia should give it a berth. Between it and New Plymouth, an extent of 70 miles of coast, there is no place of shelter except the small rivers Mokau and Waitera, which are alone eligible for coasters in fine weather.

For the first 17 miles the coast trends South, with a slight curve to Terua point, which is 400 feet high, and from the northward shows as a light yellow cliff; some scattered rocks extend a short distance off the points, but no dangers are known to exist within one mile of the shore.

Tokama-puna rock.—Off Marakopa river, 12 miles southward of Albatross point, a rock awash (*Tokama-puna*) lies half a mile distant, and there is also a reef awash nearly one mile north-west of Terua point. Whare-orino mountain, 2,074 feet high, rises over this point, and the land immediately over the coast one mile north of it is 1,000 feet above the sea.

Soundings.—At the distance of 15 miles off shore there are 40 fathoms grey sand, and as far as soundings have been obtained, this depth decreases regularly to 34 and 26 fathoms at distances of 10 and 5 miles from the land.

From Terua point the coast continues a S. by E. trend almost straight, and without presenting any remarkable feature to Mokau river, a distance of 19 miles from it, and 35 miles from New Plymouth.

MOKAU RIVER.—This river, which takes its rise in the Rangitoto mountain range, is resorted to by coasters engaged in the native trade; it has only 2 feet water over its bar at low-water springs, and at high water 14 feet: vessels of 20 tons cross it under favourable circumstances, and there is good anchorage within: it is navigable for boats for many miles, but is subject to heavy freshes. Coal and limestone are found here. The village is on a small sandy flat on the north bank of the river, shut in from the sea by a hill.

The COAST.—From Mokau river the coast runs S. by W. 20 miles, when it suddenly takes a westerly trend towards the roadstead of New Plymouth and cape Egmont. Southward of Mokau it is composed of yellow sandstone cliffs, about 100 feet high, on which the constant action of the sea has produced a curious effect, isolating portions of the projecting points, and wearing them into pillars of the most fantastic shapes.

White bluff (*Parinini*), a very remarkable cliff 900 feet high, and visible a long distance from seaward, lies 10 miles southward of Mokau river.

From Pari-okariwa, a projecting point 2 miles southward of White bluff, a long reef extends for 2 miles to the northward, and breaks only in heavy weather.

Between the rivers Mokau and Waitera there are several streams; most of them fordable at low water.

WAITERA RIVER is 9 miles north-eastward of New Plymouth, and is often run for by coasting vessels on the approach of bad weather at that roadstead, as well as for purposes of trade with the natives: there is not more than 2 feet water on its bar at low springs, but the tide ranges from 7 to 12 feet. The anchorage is off the native village a quarter of a mile within the entrance, in 3 or 4 fathoms. The river is navigable for boats a distance of 4 miles.*

The following directions for the Waitera—where the trade has latterly increased very much—are by the Harbour-master of New Plymouth :—

" There is a shifting bar entrance with sometimes one and occasionally two channels, the northern being principally used. A vessel drawing 9 feet can lie afloat in the river at all times of tide on the east side, opposite the stockyard. Shoal water with rocky bottom extends half a mile off shore on each side of the Waitera bight. The flagstaff, with yard and semaphore arm, is on the south side of the river. Masters of vessels are requested to pay particular attention to the signals, and to alter course promptly in the direction to which the semaphore arm is pointed; when it is dropped, keep steady as she goes.

"**Tides.**—It is high water, full and change, on the bar at 9h. 45m.; in the entrance the flood runs 2 to 3 knots, and the ebb 3 to 4 knots; along-shore the flood stream is eastward, the ebb westward, one to 2 knots."

Night signals.—The following special night signals are used :—

" From the shore—

" Two *red* lights vertical—Take the bar.

" Two lights vertical, *red* over white—Bar dangerous.

" From vessel—

" Two white lights horizontal, with one *red* over forming a triangle—Want to come in before daylight.

" NOTE.—In all signals described in the general regulations and in these special signals, as to two lights vertical (of whatever colour) the two lights will be so arranged as to serve for leading lights,—the upper light being on the flagstaff, and the lower at some distance in front of it. At the Waitera the two lights will appear vertical when the centre of the channel is in line with the flagstaff, the post carrying the lower light being shifted as the channel changes. The ordinary signal 'Wait for daylight' (white over *red*) will be kept up when vessels are expected or seen approaching. Vessels approaching at night, in want of a pilot, and wishing to enter before daylight, should fire a gun and burn blue lights, if possible, to secure attention. The signal 'Bar dangerous' means either that the bar is rough or that a strong fresh is running out. The signal 'Take the bar' will not be shown except in answer to a signal from vessel 'Cannot wait' or 'Cannot keep to sea,' unless there is reason to expect bad weather before morning; then it will be put up as soon as the bar is fit to take; but masters of vessels must in all cases use their own judgment as to whether they will enter at night or not.

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* *See* Admiralty coast chart, sheet VI., Manukau harbour to cape Egmont, No. 2,585; scale, m = 0·25 of an inch.

"When the signal 'Cannot wait' or 'Cannot keep to sea' is made from a vessel approaching at night before the tide serves for the bar, it will be acknowledged by covering the lower light of the signal at the flagstaff for a short time. The signal 'Take the bar' will then be made when the tide serves; but if there is great risk in entering, the signal, 'Bar dangerous,' will be made immediately before "Take the bar,' and the two together will mean that the tide is right, but the bar unsafe.

"**Caution.**—No vessel should approach at night within a depth of 10 fathoms, which will be outside the points of the reefs. In heavy S.W. gales the Waitera should not be approached. In fine weather, vessels of 9½ feet draught may enter at spring tides. Vessels drawing 7 or 8 feet may enter without difficulty.

"**Directions.**—Approaching from the northward, bring mount Egmont to bear S. ½ W., and steer on that bearing till White bluff bears N.E. by E., when the Waitera flagstaff will be S.S.E. ½ E. 2 miles distant; proceed towards it for the anchorage in 6 fathoms sand, three-quarters of a mile off shore, when the outer Sugar-loaf, New Plymouth, will be in line with Kate point, the western point of Waitera bight. A vessel may anchor with safety unless otherwise directed by the signal-master.

"From the southward, when abreast of and distant a quarter of a mile from the outer Sugar-loaf, steer N.E. till Waitera flagstaff bears S.S.E. ½ E.—(avoiding Puke-tapu reef, which is 1¼ miles long and runs parallel with the shore three-quarters of a mile distant; it also lies W.S.W. of Kate point distant 1¼ miles)—then as before directed.

"A harbour-master and pilot has been appointed to the Waitera, but a pilot can be taken on board at New Plymouth if desired."

TIDES.—On the coast the flood-stream from the northward meets the flood-stream from Cook strait in the vicinity of Gannet island, about 80 miles to the northward of cape Egmont.

CHAPTER VII.

EAST COAST OF THE MIDDLE ISLAND.—FROM CAPE CAMPBELL TO THE EASTERN ENTRANCE OF FOVEAUX STRAIT.

VARIATION IN 1883.

Cape Campbell	-	15° 15′ East.	Banks Peninsula	-	15° 45′ East.
Otago	-	16° 20′ East.			

CAPE CAMPBELL, the north-east extreme of the Middle island, will be found fully described at page 167. A low dangerous reef, with a sunken rock off its extreme, extends nearly one mile N.N.E. of the low extreme of the cape, and rocky patches extend off the shore almost the same distance for some miles to the southward.*

Caution.—It is advisable that vessels should not approach the land in this neighbourhood within 2 miles by day, unless coasters acquainted with the dangers; and especially at night, and in thick weather, great caution must be observed when in its vicinity, although now well lighted.

LIGHT.—For description of light, see page 167.

The COAST from cape Campbell to Kaikora peninsula.—The coast trends from cape Campbell S.S.W., and is rocky for the first 9 miles to the small river Waiharakaka, at which three-quarters of a mile within the entrance is Flaxburn, and where in fine weather, there is landing for boats sheltered by the reefs.†

Weld anchorage.—Two beacons have been erected on the south side of Flaxburn river, and when in line W. by N. ¼ N., lead to Weld anchorage in 8 to 10 fathoms, 4 cables off the reef at the entrance to river.‡ ("There is temporary anchorage within a line of the reefs north and south of the river entrance, in 5 to 6 fathoms, in moderate weather and off-shore winds; and a snug small boat harbour at the mouth of the river, very convenient for shipping cargo.")*

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* *See* Admiralty coast chart, sheet VIII., No. 2,529; scale, $m = 0 \cdot 3$ inches.

† *See* Admiralty chart, Anchorages on East coast, Middle island, No. 2,178; scale, m = various.

‡ The wreck of the sunken steamer *Westport* lies in 11 to 12 fathoms water, with the lower leading beacon bearing W. by N., and the wool-shed or store on the beach W. ½ N. This shed kept open of the reef which forms the boat harbour, clears the wreck to the northward. One mast (Oct. 1882) is seen about 10 feet above water, but probably it will not remain standing long.

The coast southward of Waibarakaka is sand and shingle beaches, with rocky points, for 22 miles to Waipapa point, and the steep spurs descending from Benmore mountain, which rises over Flaxbourn to a height of 4,360 feet, as well as those from the lofty Kaikora mountains to the south-westward, give to the neighbouring coast a peculiarly bold and rugged appearance.

Immediately south of Waipapa point, which is low and projecting, is Waiau-toa or Big river. The break in the Kaikora and Looker-on ranges formed by the valley of this river, has the appearance of a harbour from a distant offing: nearly 3 miles south of Big river is a boat harbour and fishery; two white streaks in the wooded cliffs point out the landing place.

KAIKORA PENINSULA is a hummocky tongue of land 330 feet high, projecting 2 miles at right angles from the coast, and lies nearly 20 miles southward of Waipapa point, and 50 miles from cape Campbell. It forms Ingles bay on the north, Gooch bay on the south, and affords shelter to coasting vessels from north-easterly and south-easterly gales.†

The Kaikora township, situated on the shores of Ingles bay, was in 1875 thinly populated, but promised to be a place of some importance in the province of Marlborough, the country adjacent having been taken up by settlers for agricultural purposes; small farms are now to be seen in a thriving condition on the suburban sections. Provisions of all kinds are easily procured by shipmasters requiring them, and water is plentiful.

INGLES BAY.—That portion of the coast line known as Ingles bay lies between Hapuku river on the north, and the northern point of Kaikora peninsula on the south. The usual anchorages are well sheltered from N.N.W., through west, to S.E. with good holding ground, in depths varying from 7 to 10 fathoms, but open to north-east and easterly gales.

With north-easters the sea does not rise to any extent, but with easterly gales, although partly protected by the peninsula and Lynch reef, a heavy sea runs into the bay. Small vessels seeking shelter from southerly and south-easterly gales should anchor well under Lynch reef in 7 to 9 fathoms, sandy bottom, which enables them to make a good board to N.N.W. should the wind shift into the north-east quarter.

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* Wellington Almanac.

† *See* Admiralty chart, Anchorages on East coast, Middle island, No. 2,178; scale, *m* = various.

The information relating to Kaikora peninsula, is from the remarks of G. A. Woods, colonial marine surveyor.

Beacons.—Four beacons have been erected on the cliffs near the sea, as leading marks, two for the outer and two for the inner anchorage. They are painted as follows:—Upper outer anchorage beacon, black and white with white perch, and elevated 105 feet above high water; lower outer anchorage beacon, red and white with red perch, and elevated 95 feet. Upper inner anchorage beacon, red, and elevated 55 feet; lower inner anchorage beacon, white, and elevated 40 feet.

Directions.—Vessels from the northward making for the anchorage may in ordinary weather steer a course direct for mount Eyes, which rises from the centre of the peninsula, until within about 2 miles of the shore, when a S.W. ½ S. course for the outer anchorage beacons on the cliffs under mount Eyes, will lead into a good outer anchorage in 10 and 11 fathoms, dark sand, within a few hundred yards of St. Kilda rocks, taking care to keep the Nine-pin rock, which lies to the north-west, open northward of St. Kilda rocks.

Vessels approaching Ingles bay from the southward in ordinary weather may steer moderately close to Lynch reef, which lies off Kean point, the eastern extreme of the peninsula, and haul up to a course keeping the Nine-pin rock well open northward of St. Kilda rocks, anchoring in any position on that line of bearing, or as before directed.

In bad weather it is necessary to give Lynch reef a wider berth, as a rocky patch of 5¼ fathoms lies N.E. by E. ½ E., 1½ cables from the north-east point of the reef, over which the sea breaks with considerable force in heavy weather from the south, and south-east.

Fyffe cove is a small harbour about 6 cables westward of Lynch reef, formed by Observation point and the projecting reef to the eastward, capable of holding, when properly moored, three or four coasters of a draught of water not exceeding 6 or 8 feet.

Directions.—Vessels making for this inner anchorage, must keep the outer anchorage beacons in line until the second set of beacons at the head of the cove are in one, when they should immediately haul up on this new line of bearing, which will carry them into the harbour, clear of a rock awash lying on the eastern side of the entrance. Care must be taken not to go off the line of bearing for Fyffe cove, as a dangerous rock with only 6 feet water lies between St. Kilda rocks and Observation point.

Moorings are laid down to the rocks on both sides of the harbour, enabling vessels to lie with their heads to the north or seaward, in comparative safety.

A jetty has been constructed by the Government to allow of small craft hauling alongside to discharge their cargoes.

A passage for vessels bound to Fyffe cove exists between St. Kilda rocks and Observation point, but care must be taken to avoid the sunken rock, before-mentioned, lying nearly in mid-channel with only 6 feet at low-water springs.

Caution.—Mariners are cautioned against bringing up amongst the kelp, for as a general rule the bottom is rocky and broken and not good holding ground.

Davidson rocks, lying N.W. ¾ N., distant $1\frac{1}{10}$ miles from Observation point, and 7 cables off-shore, form a dangerous shoal patch awash at low-water springs. Between them and the shore, and bearing N.W. by W. from Observation point, is another dangerous patch, the Ruby shoal, consisting of two conical rocks 6 feet apart, with a depth of 3 feet on it at low-water springs.

To avoid these rocks when working in or out of Ingles bay, do not open the Nine-pin rock seaward of Kean point, as that line of bearing leads on to the eastern portion of Davidson rocks; it must also be borne in mind that the current almost invariably sets to the northward on this portion of the coast, generally running stronger on approaching the shore.

Bullen cove, on the south side of the peninsula, formed by Baxter reef to the westward and Haul-round point to the eastward, cannot be recommended as an anchorage on account of the bad holding ground, and the detached sunken rocks that lie on its south-east side.

GOOCH BAY, situated also on the south side of the peninsula, lies between Haul-round point and the Kohai or Waite river. The anchorage in this bay is well sheltered from all winds but those between south and east, good holding ground being found at a depth of from 8 to 9 fathoms, with the southern extreme of Baxter reef on with Haul-round point reef extreme bearing E.S.E. In hauling into this anchorage care must be taken to avoid Cone rock, nearly awash at low water, lying south-west of the end of Baxter reef, and distant from it about one-quarter of a mile.

Vessels approaching this anchorage from the northward can haul close round the reef off Haul-round point, whence they will steer a course towards Bullens wool-shed, a conspicuous mark on the coast between the Kohai and Kahutara rivers, until mount Wharton is on with the northern peak of the Looker-on range, when they may haul up for the anchorage clear of Cone rock.

Ranges.—Between cape Campbell and Kaikora peninsula rise the lofty snow-clad mountains known as the Kaikora and Looker-on ranges; the former are midway between these two points, and 14 miles from the coast; they are 9,700 feet high, rising in sharp and rugged peaks. The

Looker-on range is 13 miles north of the peninsula, and 7 miles inland, of the same character, and 8,700 feet above the sea.

Currents.—The usual set of the stream at Kaikora peninsula is to the northward, varying a point or two according to the direction of the coast line. The velocity is from three-quarters to 1½ knots per hour.

On this part of the coast a southerly current of a knot an hour is occasionally experienced after southerly winds.

Tides.—It is high water, full and change, at Kaikora peninsula at 5h. 0m.; springs rise 6 feet, and neaps 4 feet; but both the velocity of the current and height of the tides, are generally influenced by the prevailing winds.

Winds.—A falling barometer, accompanied by a distinct view with a fine blue tint of all distant objects, such as the Looker-on and Kaikora ranges, and a remarkable transparency of atmosphere, gives warning of a north-wester. A slight fall in the barometer, with a thick bank of clouds rising to the south-east, rainy weather, and the hill-tops clothed with white mist, are certain indications of a south-easter, the barometer rising almost immediately after the wind sets in, when it continues to blow violently, with a rising glass; during the winter the prevailing winds are from the north-east. In autumn and spring they are variable between north and east, but frequently a north-east swell sets in to Ingles bay without the wind blowing home; this is considered a sure indication of north-west weather in Cook strait. The finest months are from December to March.

AMURI BLUFF.—For 11 miles southward of Kaikora peninsula, is a continuous bight, the south point of which is Amuri bluff; this bight is about 2 miles in depth, and has several outlying rocks nearly one mile from the shore; a reef 6 feet above water lies 2 miles northward of this bluff. Small coasters can moor in safety within these reefs. There is very deep water off Amuri bluff, 184 fathoms having been obtained only 2 miles from the shore.*

THE WAIAU-UA RIVER is 25 miles south of Kaikora peninsula. Its entrance may be distinguished at a distance by a lofty mountain, mount Caverhill, rising 1,900 feet above the level of the sea, 8 miles northward of the entrance. From its summit the Caverhill range extends southward, terminating abruptly on the northern banks of the Waiau-ua river; the peaks of this range are stony and rugged. The Cheviot hills forming the southern boundary of the river, are of a hummocky formation.†

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* A shoal bank of 4 fathoms is reported to exist 12 or 15 miles south of Amuri bluff, and 6 or 7 miles off the shore.—Wellington and Canterbury Almanac, 1855.

† *See* Admiralty chart, Anchorages on East coast, Middle island, No. 2178; scale, *m* = various.

The river has frequently two narrow entrances, one immediately at the base of the Cheviot hills, and the other about half a mile north of it on a shingle beach; both entrances are shifting, and the velocity of the stream on the ebb is so rapid as to render it dangerous for boats. A constant fresh is running out of its narrow entrance 60 feet in width, at the rate of 5 knots on the ebb and 2 to 2½ on the flood, rendering it unfit for navigation except with flat-bottomed steamers, when it must be taken at the last-quarter flood. Vessels would, of necessity, have to be secured to the shore within the river, as the bottom is composed of boulder stones, excepting in a lagoon running parallel to the beach on the northern side of the entrance, at the head of which from 8 to 10 feet water is found at all times, with room for two vessels to be moored.

The shoal banks within the entrance shift with every fresh, making it impossible to give any specific directions to avoid those dangers, and rendering it absolutely necessary for a pilot to be stationed here, should it be determined to open the navigation of this river.

No outlying dangers exist off the mouth of the Waiau-ua river, which can be approached boldly to within half a mile, in a depth of 4½ to 5 fathoms, but vessels should not anchor in less than 6 fathoms, as the sea breaks some distance from the land in southerly and south-easterly breezes.*

GORE BAY.—About 6 miles southward of Waiau-ua river is Gore bay, merely a slight indentation in the coast; rocks extend off the shores about half a mile, nearly to the Hurunui river, which is 9 miles from Waiau-ua river, and with it rises in the Wakarewa and Tekoa mountains, which are between 5,000 and 6,000 feet high, and distant over 30 miles inland; the Hurunui river is also only fit for boats.†

The country in the neighbourhood of Gore bay, known as the Cheviot hill station, is one of the finest grazing districts in New Zealand; it is all freehold, and from 900 to 1,000 bales of wool are shipped annually from this station alone, but the difficulties of shipment, on account of the exposed nature of the coast, are very great.

An organised boat establishment of Kanakas, from the Sandwich islands, is maintained here to man the surf-boat. The present landing place is on the sandy beach lying between McClellan point and Jed river; the beach is very flat, and for one-eighth of a mile seaward there is only a quarter to half a fathom water, when it suddenly dips to 1½ and 2 fathoms. With any swell from seaward the sea breaks over this shoal ground with great violence, and in gales from the south-east it has frequently been known to break nearly as far seaward as the general trend of the coast line in 5 fathoms water.

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* A shoal, with 4 fathoms on it, has been reported, lying N.E. by E., 5 miles from the mouth of Waiau-ua river.

† *See* Admiralty chart, Anchorages on East coast, Middle island, No. 2,178; scale, *m* = various.

There is every convenience for landing, a warping-buoy is laid down for hauling the boats in and out through the surf; landing, however, should never be attempted excepting in a whaleboat. Mariners are recommended not to venture in their own boats, but to await the arrival of one of the fine surf-boats from the shore, when they can land with safety under the guidance of an experienced resident boatman. The best landing is to be found in that portion of the bay lying between point McClellan and Gibson point, the south-east point of Gore bay. It is well protected from the southward, and the beach is comparatively steep. A difficulty exists at present with respect to this landing on account of there being no road to the interior, the only means at present being under McClellan point, at low water.

Anchorage.—The roadstead is open to all winds between south-east and north; the holding ground is good, sand and clay; but in some places foul ground exists below the sand, necessitating a stout crown rope to ensure canting the anchor.

Vessels from the southward making for Gore bay, must not approach too near to Gibson point on account of the Chapman and Mid-bay rocks, two dangerous sunken rocks which lie to the north-east and northward of that point, the latter being half a mile from the shore, but must stand on a northerly course until the outer White rock off McClellan point is well open of the Wool-shed on the beach to the northward of it. They may then haul up for a beacon which has been built on the cliffs under Cavern hill, which in one with the northern gable of a summer-house W. ½ N., will lead clear of Mid-bay rocks into an anchorage in 4 fathoms within 200 yards of the warping buoy. There is at all times a swell in the roadstead, and a vessel must be prepared to leave with the first symptoms of a south-easter.

Mooring.—"A single anchor mooring for a 200-ton vessel is laid down in Gore bay, about 400 yards from the shore, opposite the new landing slip, in 3½ fathoms, sheltered from all winds except from north to east, which blow right in, but seldom with great violence. Sailing vessels, if caught in such weather, will not be able to beat out from the mooring, and are advised to use their anchors in addition to the mooring. The boating establishment, when completed, will be very efficient, and with a vessel at the mooring great despatch in loading and discharging will be ensured.

Vessels bound to Gore bay will find no difficulty in making out the landing place, which is situated immediately within the south side of the entrance. It should be brought to bear S.W. by W. when 2 miles from shore, thence steer straight in. Large vessels should anchor in a convenient depth until a boat arrives. Seaward of the mooring the anchorage is open to the south-east, but from here a vessel can get under weigh with the wind in."*

CURRENTS.—In the offing strong currents setting to the northward are experienced, often running 1½ knots per hour after south-east gales.

SAIL ROCK lies close off a projecting cliffy coast 4 miles southward of Hurunui river; 8 miles further to the south-west is Motunau, or the Table island of Cook, which, like Sail rock, has a white appearance in bright weather.

TABLE ISLAND (*Motunau*) is small, lying three-quarters of a mile from the shore, and almost connected with it by reefs; there are also reefs extending nearly one mile to the eastward and southward, and a rocky patch, with 4 fathoms, 2 miles S.S.W. of it. The island affords shelter for boats.

From Table island the coast recedes to the westward, becomes low and sandy, and forms Pegasus bay, the south side of which is Banks peninsula; the shore of this bay forms the sea face of the northern portion of the great southern or Canterbury plains.

PEGASUS BAY is nearly 40 miles in extent, north to south, and 15 miles in depth; its northern shore, from Table island to Double (or the north-west) corner, a distance of 12 miles, is cliffy, with a sand and stony beach at low water. Four miles westward of the island are two shallow patches, the only dangers in Pegasus bay, extending one mile from the shore; they should be avoided.

From Double corner, where there is good boat landing in fine weather, a sandy beach extends 27 miles nearly to the entrance of port Lyttelton or Victoria; five rivers run into the sea along this beach after winding through the plains; the three northernmost are dry at their entrances at low water, the next is Courtenay river (*Waimakariri*).

Soundings.—The depth of water across the entrance of Pegasus bay is 20 fathoms, which shoals gradually to 6 and 7 fathoms one mile from the sandy beach: this regular change in the soundings, and the distance they extend off this part of the coast in particular, renders the approach to port Lyttelton easy at night or in thick weather.

WAIMAKARIRI RIVER.—The entrance to Waimakariri river bears from Godley head N.W. ¾ N., distant 12 miles. There is a bar, which is constantly shifting and varying in depth. A signal-staff with semaphore arms, similar to that at Sumner, stands on the highest sand-hill immediately southward of the entrance; also two moveable beacons are placed on the south spit and kept in one as nearly as possible with the deepest water over the bar, which has generally about 3 feet on it at low-water spring tides. Vessels of 40 tons can ascend the river about 8 miles to Kaiapoi, the navigation of which is easy, the channel being well staked.

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* Marine Department, Wellington, 1878.

AVON RIVER (*Opawaha*).—The entrance of this river lies at the south extreme of the sandy beach of Pegasus bay, and is 2½ miles W. by N. of Godley (or Cachalot) head, the north entrance point of port Lyttelton; as a means of conveying cargo, between that seaport and the plains, it is of great importance to the Canterbury settlement, and in moderate weather is accessible to vessels drawing from 8 to 10 feet water. The bar is one quarter of a mile outside Cave rock, the southern entrance point, extending from which are rocks above water; it is 400 feet in width, composed of fine sand, and has a depth in the channel of not less than 5 feet at low-water springs, shoaling gradually on either side.

The entrance to the river lies at first in a southerly direction, and when a quarter of a mile within the bar it bends rather suddenly to the westward; the narrowest part of the channel, which is at the elbow, is 150 feet wide, but on passing it where a vessel would turn, there is a space of 400 feet with not less than 9 feet at low water, and in the channel to Shag rock 10 to 11 feet.

The river takes its rise in a swamp in the plains, and being unconnected with the mountain ranges is less liable to changes from sudden and rapid streams; the greatest strength of the current does not exceed from 5 to 6 knots. The highest water on the bar would be 12 feet at springs, and 9 to 10 at neaps, the range of tide being from 7 to 5 feet.

Signals.—On Cave rock at the entrance to Avon river stands a signal staff, from which are exhibited the New Zealand General Tidal and Bar signals, and vessels are piloted in by means of semaphore arms.* Vessels of 40 tons can enter safely at the proper time of tide, and ascend the river to the ferry, and smaller craft to the quay within 2 miles of Christchurch. Small steamers now run between Lyttelton and Christchurch; under favourable circumstances the bar may be crossed in open boats with perfect safety.

By taking advantage of moderate weather, which can always be judged of before leaving port Lyttelton, the bar may be crossed without risk of loss or damage to cargo in a decked vessel of the draught before mentioned. The greatest difficulty of this river appears to be the getting out, and the

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* *See* page 15.

[illegible]

SOUNDINGS between Cape Campbell and Banks peninsula.—[illegible] Large [illegible] 30 fathoms [illegible] from the shore [illegible] will be found. [illegible] there is a depth of [illegible] 27 [illegible] from the shore. [illegible] there is a depth of [illegible] at the distance of 27 miles from about the middle of Pegasus bay, the same depth will be found.

CURRENTS.—In this part of the coast a northerly set will generally be experienced; but occasionally after southerly winds it has been found to set in the opposite direction.

BANKS PENINSULA.—This singular projection contains, with the exception of Otago, the only harbours on the eastern side of the Middle Island. Until a recent period, it was laid down on the charts as a peninsula connected with the mainland by a low and narrow neck only: it is, however, in reality a mass of rugged and, in parts, densely wooded mountains, generally about 3,000 feet high, falling rapidly to the plains from which the promontory projects, bounded by a coast line which is exceedingly broken, and indented with numerous bays and coves. It extends from the mainland in an easterly direction over 20 miles, and maintains an uniform breadth of 16 miles; on its southern side is the Waihora lake, an extensive but shallow sheet of water, which washes the base of the mountains to their junction with the plains, a distance of 8 miles; this lake is only separated from the sea by a strip of low shingle, about half a mile wide.

From the remarkable appearance of this apparently isolated land, there is no possibility of a vessel mistaking her position; and the navigator will derive considerable confidence in approaching at night, as the bank of soundings extends 25 miles from the coast, a feature almost peculiar to this part of New Zealand.

The principal harbours are port Lyttelton (or Victoria) and Akaroa harbour; also port Levy and Pigeon bay, snug anchorages; besides several smaller ones, which, though exposed for ships, offer shelter for boats passing from one harbour to another, or for those employed in the shore whaling establishments.

PORT LYTTELTON or VICTORIA* (*Tewhaka*), the principal port for the Canterbury district, lies on the north-west side of Banks peninsula, having a common entrance with port Levy, the entrance being 2½ miles from the south end of the sandy beach of Pegasus bay; it is 2 miles wide between Godley head on the west and Baleine point on the east, and runs in a S.W. by W. direction 7 miles. Toloa or Adderley head, between the harbours, lies back from the other two; the entrance between it and Godley head is one mile wide. The town of Lyttelton is situated on the north shore within the inner harbour, 4 miles from the heads, and is connected with the city of Christchurch by rail, over which the exports of the greater part of the district are conveyed to the port. Above the inner harbour there is only sufficient depth of water for small coasters.

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* Formerly known as port Cooper. *See* Admiralty chart of ports Lyttelton (Victoria) and Levy, and Pigeon bay, No. 1,999; scale, m = 1·6 inches.

The following extract from a letter written in 1855 by Mr. J. W. Hamilton, Collector of Customs at port Lyttelton, is a valuable addition to our knowledge of this harbour:

"The harbour has proved, as regards all winds from seaward, perfectly safe; the " severest and most trying gales blow down the harbour from S.W., and though with " only a fetch of 4 miles, and a portion of that over shoal ground, it sends quite a " heavy sea on the beach at Lyttelton, on which two vessels have been wrecked from " anchoring within the points of the bay, where the holding is not good."

From the report of the Lyttelton Harbour Commission in 1863, it appears that in summer, when the north-east winds prevail, a considerable swell rolls in from seaward. From the foregoing considerations, it has recommended the construction of a breakwater and wharf from Officer point, to take a south-westerly direction for 700 yards; curving the head of the breakwater to the westward to give partial protection from the sea, which gets up during the fiery south-west gales. The Commission has also recommended for immediate extension the Government jetty, 130 yards, for convenience of discharging cargoes, with proposal for a further extension, which, with the breakwater from Officer point, will effectually give secure protection from all winds and weather.

As the progress of the province of Canterbury has been demonstrated in the increasing value of the imports and exports (the imports alone being in one year an increase of 278,221*l.*), the above suggestions for the improvement of the port will probably be accomplished.

The Commission has also recommended the following, bearing on the navigation of the port:—

As the headlands near the entrance of port Lyttelton, when capped by fog, or in thick weather, or when the light is very dim, become so much alike in outline, colour, and general appearance, some leading landmark is greatly required, and therefore it has been suggested that a distinctive mark be painted on the face of Godley head. It should be at the height of 50 feet above high water, it would then be always visible below the line of fogs, which hang within 135 feet of the sea, and which would obscure any beacon erected on the summit of the headland.

It is strongly urged to lay down in the roadstead and fairway for large ships, a sufficient number of heavy substantial screw moorings with large and conspicuous buoys, and for coasting traders an ample supply of such screw moorings in Erskine bay with buoys.

Since 1851 the size of square-rigged vessels frequenting the port of Lyttelton has increased from an average of 500 tons register, drawing 14 feet water, to 1,500 tons register, drawing 18 to 20 feet; when laden the largest vessel entered (1875) drew 18 feet water and was 2,340 tons register.

GODLEY HEAD and LIGHT.—Godley head is a perpendicular volcanic cliff of a dark red colour. The lighthouse, 30 feet high and painted white, stands on the edge of the cliff, and makes from the eastward as a small square white house with a hill in the background. From it is exhibited a *fixed* white light, 450 feet above the level of the sea, seen between the bearings of W. ¼ N., through west and south, to S.S.E. ¼ E., or through an arc of 120°; visible in clear weather 30 miles. From the great altitude of Godley head light, it may be expected that it will be often obscured by fog.

Pilot.—The pilot station is in little port Cooper at the foot of the western side of Adderley head; a look-out is kept day and night. Vessels requiring a pilot after dark should, when nearing the heads, burn a blue light or show a flare-up, and the signal will be promptly answered by the pilot, unless engaged with another vessel, in which case a ship may with safety proceed up the fairway of the harbour and anchor below the shipping in 5 fathoms. The harbour pilot will shift her at daylight to a proper anchorage, or into the inner harbour.

In approaching the harbour from the northward, mount Herbert, the highest peak of the peninsula, is a prominent mark, port Lyttelton lying westward of it.

On a nearer approach, mount Pleasant, the highest peak on the north side of the harbour, is easily distinguished, being bluff towards the port and sloping off gradually to the low land of the plain.

The Knobs, at the head of the harbour, are two or three remarkably round, wooded, overhanging peaks, and form a leading mark for steering up the harbour, with the house* on Quail island under them bearing S.W. by W.

Vessels from the southward after rounding the peninsula, should keep along the land, about 1½ miles off, until they open out ports Lyttelton and Levy.

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* Burnt down in 1878.

There is good anchorage outside in calm or southerly weather, in 9 or 10 fathoms at 4 or 5 miles from the shore.

The entrance to the port is one mile wide, and maintains the same width as far as the anchorage off Lyttelton. The course up port Lyttelton is S.W. by W. ½ W.; the entrance heads are bold and steep-to, with 8 fathoms between them, which depth decreases gradually to 3½ fathoms at the anchorage. There are no dangers on either side in working up, with the exception of Parson rock, a small detached pinnacle, with 8 feet on it at low water: it lies in a N.N.W. direction from Ripa islet, (near the south shore, 3 miles within the heads,) and is 1½ cables from the shore. A small red buoy marks the position of an outlying detached rock of 14 feet, about 30 yards outside the 8-feet rock.

Port Lyttelton is easy of access in most weathers, except in south-west gales, which draw out with great violence. It is somewhat open to easterly winds, but gales from that quarter are not of frequent occurrence, north-east and south-west being the prevailing winds. With strong northerly and easterly winds a considerable swell rolls into the harbour.

The harbour authorities assert that as the bottom for the greater part is composed of soft mud, it has been proved to be safer for vessels to lie at single anchor with a long scope of cable (60 or 70 fathoms), with the second anchor ready, than moored.

Tides.—It is high water, full and change, at port Lyttelton at 4h. 20m.; springs rise 7½ feet, and neaps 4 feet. The tides are irregular during both springs and neaps, on which dependence cannot be placed, being greatly affected by the wind.

Little port Cooper is a small bay immediately within Toloa head, the south entrance point, which whale ships formerly frequented for water, &c.; it is open to northerly winds. Three miles further up, on the same side, is a deep cove, but is too shallow for anything but boats.

Quail island, connected at low water with the mainland, also lies on the southern side of the port, opposite Lyttelton, and 1½ miles distant from it.

Shag reef lies midway between Quail island and the town with a rock on its west extreme, 8 feet high. An iron buoy, painted red, lies in 15 feet water at nearly a cable eastward of the east extreme of the reef.

Outer anchorage.*—Vessels of large tonnage using this anchorage should anchor fully three-quarters of a mile outside Shag reef, with the eastern point (Officer) of Erskine bay,—in which the town stands,—in a line with the Custom house bearing N.N.W. ¾ W.; this berth will be in 3½ fathoms at low water, with good holding ground, muddy sand, at a distance of 3 to 4 cables off the eastern breakwater. The eastern or outer end of the town should not be opened out. Strangers are recommended to bring up well south-eastward of the breakwater.

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* During the stay of H.M.S. *Challenger* at this port in 1869, strong sea-breezes were experienced, which sent in a heavy uncomfortable swell. The holding ground, although mud, is of such a treacley consistency, that during strong breezes ships nearly always drag their anchors, slowly but surely, through it. The *Challenger* dragged nearly a cable in 86 hours, with 50 fathoms of chain out and a clear anchor; while merchant ships dragged much further. I feel convinced that no vessel would hold in this port during a strong north-east gale; the sea would then break in 5 fathoms.—Remarks by Nav. Lieut. H. Y. Slader, H.M.S. *Challenger*, 1869.

Inner harbour.—Since the Harbour board was constituted in the beginning of 1877, extensive improvements have been in progress. The port being somewhat exposed to easterly winds, a secure Inner harbour has been formed by the construction of moles extending from Officer and Naval points, of rubble, faced seaward with huge blocks of stone. The eastern, or Officer point breakwater, is 2,010 feet in length, 40 feet wide on top, and 6 feet above high-water mark. A timber breastwork is built on its inner side almost along its entire length, and is named Gladstone pier. The western, or Naval point breakwater, is 1,400 feet in length; and within the harbour facing the town, are six screw-pile jetties with lines of rails laid on them worked by the railway.

The space of water thus enclosed is 110 acres with 8 sets of screw moorings laid down. The depth of water inside the eastern breakwater and at the wharves (1880), varies from 23 to 16 feet at low tides, where vessels of over 2,000 tons can be safely berthed. There is a tug boat belonging to the Harbour board, by which towage is very reasonable. Vessels anchoring under the western breakwater must leave the approach to Peacock's wharf quite clear.

There is a width of 550 feet between the mole heads, with a depth (1880) of 17 feet 4 inches for 230 feet in mid-channel.

Light.—A fixed *red* light 15 feet high is shown from the extreme of the eastern breakwater.

Caution.—Masters of vessels are cautioned against entering between the moles at *night*, and they must not anchor with the Inner harbour lighthouse on the eastern breakwater anything to the northward of N.W.*†

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* "During the dredging operations now in hand in the fairway at the entrance of the Inner harbour, between the two moles, masters of vessels are cautioned to take the entrance eastward of the dredger and her buoys. The dredger's S.W. bower anchor is laid about 600 feet outside the moles marked by a large red buoy. The side moorings will be similarly buoyed. All steamers are required to slow their engines to *less than half-speed* for at least 100 yards before arriving abreast of the dredger."—Harbour-master, 1880.

† Navigating Lieutenant C. W. Stuart in his Remark book for 1882, observes:—"The dredge is at work inside the breakwaters, and there is berthing for ships of 24 feet draught, it being the intention of the authorities to dredge the whole of the Inner harbour to that depth."

Graving dock.—On the west side of the harbour at Naval point is a graving dock of the following dimensions:—length over all, 450 feet; length on floor, 400 feet; width on floor, 46 feet; width on top, 82 feet; at entrance, 62 feet; with a depth of 23 feet over the sill at high-water springs. Opened January 1883.

Patent slip.—There is a patent slip building alongside the dock, suitable for vessels of 590 tons.

Signal stations.—Signal stations have been established on the hill above Toloa head, and at the Observatory (a dark red building faced with white stone), whence all vessels are signalled.

Time ball.—A time ball is dropped daily from the Custom house at 1h. 0m. 0s. New Zealand mean time.

Note.—Throughout New Zealand one uniform time is kept, called "New Zealand mean time," computed for 172° 30′ E. long., or 11h. 30m. 00s. from the meridian of Greenwich.

Quarantine station.—A Quarantine station has been erected on Ripa island.

"**The Telegraph cable** is laid across the harbour one-quarter of a mile within the heads, from a small sandy bay in the N.E. corner of little port Cooper to a small bay on the north shore of the harbour. Vessels should anchor seaward of a line through Godley head lighthouse and the look-out house, painted white, on Adderley head; or not until westward of the white painted patches, 20 feet by 8 feet, half a mile inside the heads, bearing from each other N.N.W. and S.S.E. By attention to these instructions, there will be no risk of fouling the cable."*

On the south-west side of little port Cooper, the position of the landing place of the submarine telegraph cable is marked by a vertical white mark, which is conspicuous from seaward for a distance of 3 or 4 miles.

Water.—Fresh water is brought from Christchurch by rail, and consequently is expensive, being from 6*s*. to 7*s*. per ton.

PORT LEVY† (*Koko-rarata*), is close eastward of port Lyttelton, the south head of the latter (Toloa) forming its western entrance point; the port runs in a due south direction for little more than 3 miles, and is three-quarters of a mile wide at the entrance, narrowing gradually within. It is free from dangers, with the exception of some straggling rocks which extend about half a cable off its western shores, and which beating in or out must be avoided. The soundings decrease from 8 fathoms at the entrance to 3½ fathoms 1½ miles within, where a vessel should anchor; the holding ground is good, but the port is open to northerly winds; whale ships, however, which in the early settlement of the colony used to frequent both this port and Pigeon bay, have ridden out a whole winter's gales in them. The upper part is shallow, and only fit for small coasters.

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* Harbour-master, 1880.

† *See* Admiralty chart, ports Lyttelton (Victoria) and Levy, and Pigeon bay, No. 1,999; scale, $m = 1{\cdot}6$ inches.

Toloa head is bold and perpendicular. Baleine point, the eastern entrance point, is rocky, but not high, with a rock above water extending about half a cable off it, on which a small beacon consisting of an iron staff and cage, painted white, is erected, as in a fog it was very difficult to distinguish this rock from some outlying rocks about a mile to the eastward. There is also a rock lying off the point, a quarter of a mile further to the eastward, between which and the shore is a boat passage. A detached conical rock, with a sunken rock a short distance outside it, lies 1½ cables off shore one mile eastward of Baleine point.

PIGEON BAY (*Wakaroa*), which is very similar in feature to port Levy, and situated 2¾ miles east of it, runs in a parallel direction 4 miles, being separated from it by a ridge of hills from 1,500 to 2,000 feet high. It is equally easy of access, but the deep water runs farther up, as vessels may anchor in 3½ fathoms, 2½ miles within the entrance.

Sinclair's farm is in a bay in the south-west corner of the port, and 15 feet will be found half a mile off it at low water. At 1¾ miles from the entrance on the western side is a deep ravine, with a good stream of water, and anchorage off it in 5½ fathoms, with good holding ground. The eastern entrance point, Wakaroa, has some rocks lying nearly a cable off it, and a sunken rock has been reported to exist from 1½ to 2 cables due north of Pigeon point, the western entrance head; otherwise it is free from dangers. This port was formerly a favourite resort of whale ships.

Between Pigeon bay and the eastern extreme of Banks peninsula, a distance of 14 miles, there are several small bays and bights, the principal of which are Akaloa, Oken, and Bone bays; they are each little more than one mile in depth, and about half a mile in width; the coast between them is steep and iron-bound.

AKALOA is a double bay; the rocks extending from the middle head to the north-west, almost close the western portion. The eastern bay runs in a southerly direction nearly 2 miles, and is narrow, but has 4 fathoms one mile within.

Longlookout point, a remarkable steep and projecting point, is the eastern point of Akaloa bay.

A sunken rock with a depth of 12 feet at low-water, (the least water found by the harbour-master of port Lyttelton,) on which the ship *Catherine* struck in September 1863 ; and also on which the Brig *Clematis* was wrecked in 1881, lies 1¼ cables from the north extreme of Longlookout point, and nearly one cable outside the edge of a low shelf, uncovered at low-water, extending from the point; between which and the rock is a depth of 5 fathoms.

The rock is steep-to, there being 6½ fathoms on its seaward side increasing to 10 fathoms at the distance of 3 cables.

It is *proposed* to erect on Longlookout point two beacons painted white, to indicate the direction of the rock.

CURRENT.—There is a constant current setting to the northward off the peninsula, varying in strength from one to 2 knots per hour according to the wind.

SAIL ROCKS are a detached cluster standing a third of a mile off the coast near the east point of Oken bay; in their immediate vicinity the coast line becomes low, which adds to their sail-like appearance when seen as an extreme of the land.

BONE BAY is nearly at the eastern extreme of Banks peninsula, being 1½ miles northward of East head. It runs in a westerly direction and has anchorage nearly one mile within the entrance in 4 fathoms; the south entrance point, a perpendicular cliff from 300 to 400 feet high, is appropriately named Steep head. Neither of these bays can be considered eligible for any but small vessels, as they are exposed to easterly and north-east winds.

From Putakolo head, which is high and cliffy, and one mile south of East head, the coast rounds away to the southward and westward.

Soundings.—The depth of water one mile off shore, from port Lyttelton to Bone bay, is from 9 to 10 fathoms, sand bottom; to the southward the soundings increase to 12 and 20 fathoms at the same distance.

Pompey's pillar.—On the southern side of the peninsula, 11 miles from East head, is the entrance to Akaroa harbour: the intermediate coast is rocky and indented, with numerous narrow but deep bays; the projecting points are cliffy with straggling rocks near; among the latter, 4½ miles north-east from Akaroa head, is a remarkable columnar rock, known as Pompey's pillar.

AKAROA HARBOUR penetrates Banks peninsula in a northerly direction more than 8 miles, its inner part approaching within 4 miles of the head of Pigeon bay; it is a magnificent port, affording secure and landlocked anchorage to any number of vessels, and is easy of access in moderate weather.*

Caution.—During strong south-west winds there is a heavy cross sea at the entrance, with violent baffling squalls caused by the high precipitous nature of the shores; at such times entering with a sailing vessel is attended with some degree of danger.

LIGHT.—A white *flashing* light, at an elevation of 270 feet above high-water level, showing a flash *every* 10 seconds, is exhibited from a white tower, 28 feet high, standing on Akaroa head, east side of entrance, which in clear weather is visible from a distance of 23 miles all round where not intercepted by the land.

Boat rock.—The heads are bold and steep; off Trueni point (the eastern), at a distance of 2 cables from the shore, lies Boat rock, a black rock 20 feet high, having the appearance of a boat from a distance.

Iron head (*Timatim*), the western entrance point, is a high perpendicular cliff of a dark grey colour; detached rocks 15 feet high extend to the southward of it, and others outside them, on which the sea breaks, extend nearly 3 cables from the shore.

Wright rock lies S.W. ¾ S. about 6 cables from the south head of Akaroa harbour; it is pinnacle-shaped, with 11 feet water over it at low water, and only breaks in a heavy sea. No kelp marks the locality.

The Harbour entrance is nearly one mile in breadth, and continues so to Cavern head, a steep cliff on the eastern shore, 1¾ miles within; here it is somewhat less in breadth, but immediately afterwards increases to 1¼ miles, which it carries to the anchorage in Pakaeriki bay, on the eastern shore nearly 6 miles from the heads. The harbour trends N.W. ½ W. at first, and then N. by W.

Anchorage.—Vessels should not anchor until above Nine-fathom point, which is 2¼ miles inside the heads; outside this there is generally a swell, the depth from 14 to 10 fathoms, and the holding ground not good; above this point the depth decreases gradually from 9 to 6 fathoms, and in Pakaeriki bay there is excellent anchorage, in 4 fathoms at low water, little more than half a mile off the settlement.†

Danger.—A reef of rocks, awash at high water, extends over a cable off Observation head, the south or outer point of this bay, off the extremity of which a red buoy has been placed; otherwise there are no dangers.

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* *See* Admiralty plan of Akaroa harbour, No. 1,575; scale, *m* = 2·5 inches.

† It was here that a few French agriculturists established themselves in 1840 under the auspices of the Nantes-Bordelaise Company, a small French association. A resident police magistrate is stationed here.

This settlement is now principally used as a watering place for Christchurch, and a railway to connect it with the main line is in contemplation; the surrounding districts are well settled by farmers employed in daily pursuits.

There is an extensive sheet of water above Pakaeriki bay, with good anchorage in every part in not less than 3 fathoms at low water. A remarkable peninsula projects from the head of the harbour three-quarters of a mile in a southerly direction, connected by a long narrow neck.

Onoui bay, westward of the peninsula, is shallow within Massacre head, but the three bays to the eastward are available for vessels of 12 or 14 feet draught at low water. There is a road from this head of Akaroa harbour to port Lyttelton.

Wood and water are to be obtained in abundance at Akaroa; there are streams running into all the bays.

Tides.—It is high water, full and change, in Akaroa harbour at 3h. 24m.; springs rise 8 feet, and neaps 6 feet; its influence is very little felt in the harbour.

The winds generally draw either up or down, and vessels should not attempt to leave with a strong southerly wind.

Soundings.—A bank of soundings, with anchorage in 10 fathoms, is reported as lying from 2 to 3 leagues off Akaroa heads.

From AKAROA to the WESTWARD.—Leaving Akaroa harbour the coast takes a westerly direction, and at the distance of 6 miles its cliffy outline is broken by Peraki cove, which is similar in character to the small bays on the northern side of the peninsula; it is a snug anchorage with off-shore winds. A single whale ship, carefully secured, has ridden out a winter's southerly gales in it; these gales are not unusual, and blow with great violence.

Four miles westward of Peraki, completes the circuit of this singular promontory, and its rugged and imposing coast line is succeeded by a low cliffy and shingle shore, 70 miles in extent.

The NINETY-MILES BEACH,—to preserve the name given to this line of coast since it was first visited by Europeans,—commences, as has been observed, from the south-west extreme of Banks peninsula: the first 15 miles is a narrow strip of shingle beach about half a mile wide, forming the sea boundary of Waihora lake. At its southern end it communicates with the sea through a narrow opening in the shingle, but is closed, however, for a great part of the year; hence the coast trends

S.W. 55 miles, and is composed of low cliffs from 20 to 40 feet high, fronted with a shingle beach.*

Several rivers find their way to the sea through this beach after traversing the plains from the base of the hills 25 miles inland; these rivers are only available for boats, and their depth and velocity vary according to the seasons.

TIMARU.—At the extreme of the Ninety-miles beach a rocky projection from the coast occurs on which is the township of Timaru, 1¼ miles north-west of Patiti point, the site formerly of an old whaling station, but now a port of considerable importance for the southern part of the Canterbury district. The trade of this extensive pastoral district is rapidly increasing, and railways connect it with Christchurch and Dunedin. It is a port of call for the coastal and intercolonial steamers. The mountain ranges approach here near the coast, and instead of the low level country existing farther north, the land consists of grassy slopes ascending gradually to the higher ranges. Seven miles northward of Timaru two isolated clumps of trees will be seen about 3 miles inland; the Wanganui river runs between them, and they are remarkable as being the first wood seen on the coast south of Banks peninsula.

The coast line from Banks peninsula to Timaru is low, and cannot be seen in thick weather or by night until close in with the breakers, while southward of the town of Timaru, the cliffs are from 30 to 40 feet high; this is a sure guide to Timaru, viz., low shingle beach to the northward: moderately high cliff to the southward.†‡

A vessel can safely stand off and on this part of the coast by keeping outside a depth of 7 fathoms.

If the weather is clear the high mountain range will be seen behind Timaru long before the coast line has risen. Burke's pass, a remarkable gorge almost directly behind Timaru, is a good landmark, showing a distinct gap: there is a village a short distance north of and in sight of Timaru, but the cliffs before mentioned will prevent any mistake.

Directions.—Vessels bound for Timaru, after rounding Banks peninsula, should steer S.W. ¾ W., unless the wind be strong from E.S.E., which causes an inset, when it is necessary to keep three-quarters of a point more southerly.

A flag-staff and storehouse point out the landing place—which is said to be good—on the beach at Timaru; thence a rocky line of coast extends a long mile S.E. to the projecting Patiti point: this shore is fronted by sands and shoal patches, with outlying reefs of rock and kelp always breaking, the reefs extending nearly two-thirds of a mile direct to seaward from Patiti point, and 1½ miles to the south-east from the storehouse at Timaru. The harbour-master reports "that the reef off Patiti point extends a quarter of a mile further than is marked on the charts, and should have a wide berth."

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* *See* Admiralty coast chart, Ninety-miles beach to Otago, sheet IX., No. 2,532; scale, m = 0·3 of an inch.

† From the authority of Captain F. E. Gibson, Chief Harbour-master of the province of Canterbury.

‡ Some information on Timaru is derived from Brett's New Zealand Pilot, 1880.

LIGHT.—In the town, a *fixed* light is exhibited from a wooden tower, 30 feet high and painted stone colour, at an elevation of 85 feet above the sea, which should be visible in clear weather from a distance of 14 miles. The light shows white between the bearings of N. by W. ¾ W. to West; *green* between West and S.W.; and white from S.W. to S. by E. ¾ E., and bears from Patiti point N.W. ½ N. 1¼ miles.

If made by night bring it to bear W.S.W., and run in on that bearing, anchoring in not less than 4½ fathoms.

Breakwater.—Cargo hitherto has been taken off in large surf-boats, but a breakwater is now (1880) being constructed which is to extend 1,000 feet to the eastward, thence 1,000 feet at right angles to the northward. Inside this latter length there will be a depth of 20 feet at low-water springs.

A wharf is building where vessels can lie in moderate weather and discharge; and mooring buoys, for steamers only at present, are placed inside the breakwater.*

Lights.—Two *red* lights, placed 10 feet apart and elevated 18 feet above high water, are exhibited from the extremity of the breakwater, and should be visible seaward in clear weather from a distance of about 4 miles.

Pilot, etc.—A pilot can always be obtained, and there is an efficient rocket-brigade always in attendance near the lighthouse, where a look-out is kept on the approach of and during bad weather, and every assistance rendered when required. Boats can now always be launched under the breakwater. A tug for towing purposes is now (1883) stationed at Timaru.

Population.—In 1878, Timaru had a population of 7,222.

Anchorage.—The breakwater now in course of erection alters the conditions of anchoring, &c., which on completion revised directions will be necessary. At present (1880) there is a depth of 18 feet alongside the part already completed. The roadstead of Timaru was surveyed in 1858 by Lieutenant Woolcombe, R.N., who proposed berths for fixed moorings on the under-mentioned bearings. "For a ship of 1,000 tons, the storehouse at Timaru, bearing W. by N., about one mile distant, and the extreme of Patiti point, S. by W. in 6¼ fathoms, fine sand; and for small vessels the storehouse bearing S.W. ¾ S., about half a mile distant, and Patiti point S. by E. ¼ E., in 4½ fathoms, fine gray sand; both these berths are within half a mile of the outlying reefs."

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* The Timaru Harbour board has notified,—"that the conveniences afforded are specially suitable for vessels drawing anything up to 15 feet, although vessels exceeding that draught can be lightened at the outer anchorage, then brought under the breakwater, discharged and loaded down to the 15 feet allowed, the balance of their cargo being put on board at the outer anchorage."—*S. & M. Gazette*, 12th May 1883.

SIGNALS.—In addition to the general signals for the colony, published in the "New Zealand Harbour Regulations,"* the following local signals are used as required:—

Four balls horizontal on yard, two on each side of mast - - - -	Vessel may stand in safely.
Three balls horizontal on yard, two on one side of mast, and one on the other - -	Anchorage not safe, keep to sea.
Two balls horizontal on yard, one on either side of mast - - - -	Put to sea.
J.D. commercial code - - - -	The vessel is running into danger.

Night signals.—The night signals are as published in the New Zealand Harbour Regulations; but when it is intended that vessels at anchor should put to sea, two guns will be fired in addition to showing the proper lights.

By night, should a vessel part or be in danger of dragging on shore, as a last resource, slip and if unable to reach inside the breakwater, run her on the beach as near Le Crens gully (to the north of the town) as possible; let the hands remain by the wreck, and assistance will be given by means of a rocket fired over the vessel.

"Vessels frequenting this port should be provided with at least one extra heavy anchor and strong cable. There is a good boat establishment."†

The Coast line from Patiti point to the southward is again formed of low cliffs fronted by a shingle beach, and extends 30 miles in a S. by E. direction to Waitangi (*Waitaki*) river, with several small streams intervening. A high mountain range (3,500 feet), known as the Hunters hills, approach within a few miles of the coast between Timaru and Waitaki river.

WAITANGI RIVER (*Waitaki*) is a considerable stream, flowing through a plain of some extent in a west direction, though only 10 or 12 miles in width; its entrance may be known by the low tongue of land it appears to have thrown out from the hills near. It is fed by the numerous lakes and mountain ranges in the interior, and the velocity in summer, during the melting of the snows, is so rapid as to render it unfit even for boats to enter. For nearly 30 miles southward of the river, and extending for the most part as far inland, the country is a rich grazing district. This river may be said to form a natural boundary between the Canterbury and Otago settlements.

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* *See* page 15.

† Marine Department, Wellington.

The Coast from Waitaki river trends S. by W. ½ W. 25 miles, to Look-out bluff. The low cliffy coast with shingle beach continues for 15 miles, or as far as cape Wanbrow, a projecting bluff of moderate height, thence it assumes a different aspect, being broken into sandy or shingle bays, with cliffy points between.

LIGHT.—On cape Wanbrow a fixed *red* light is exhibited, visible from seaward between the bearings of N.N.W. and S. by W., a distance of 5 to 7 miles. Cape Wanbrow bearing S. by W. indicates the outer anchorage at Oamaru.

OAMARU, situated at the extreme north of the Otago provincial district, is rapidly rising into importance. It is the shipping port of the largest pastoral and agricultural districts in the province, and the line of railway passes through it. Its building stone is unrivalled and to be had in any quantity; limestone, cement, pipeclay, and coal also exist in abundance. It is the second town of the province, its population in 1878 was about 6,000.*

Breakwater.—A substantial concrete breakwater has been carried out to a distance of 1,850 feet in a northerly direction from the Bluff; and a mole of 1,720 feet, to run in an easterly direction, is in course of construction, which with the breakwater will enclose a space of 60 acres in extent, forming a safe harbour, with an entrance 400 feet in width, which it is proposed to deepen to 20 or 24 feet, so as to admit a large class of vessel. At present (1883) it is safe for vessels not exceeding 16 feet draught.

Wharves have been built and moorings laid down, and vessels of 600 tons register have loaded for home ports.

Light.—A fixed *green* light is shown from a staff at the northern end of the breakwater, elevated 16 feet above the sea-level, and should be visible in clear weather, between the bearings of N.W. and S.S.W., from a distance of 3 or 4 miles.

Anchorage.—Close northward of cape Wanbrow is the outer anchorage, safe with all winds excepting those between N.N.E. to S.S.E. Vessels can stand in till within a mile of the breakwater, and anchor in 5 or 5½ fathoms. There is a depth of 4½ fathoms at the distance of a quarter to half a mile outside the breakwater. Dredging within this will be necessary for the port, to enable vessels of large tonnage to load in the basin. There is a good boat establishment.

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* Some information on Oamaru is derived from Brett's New Zealand Pilot, 1880.

Note.—When the harbour works are completed revised directions will be necessary.

Danger signals.—The following danger signals are shown from a flagstaff on the cliff immediately south of the breakwater.

Put to sea or keep at sea:—

By day:—Two balls horizontal on yard, on either side of mast.

By night:—Two white lights placed horizontally, with a *red* light between them.

Note.—In bad weather the *green* light at the extremity of the breakwater cannot be shown.

As the danger signals have at times to be made during calm weather, mariners must exercise judgment as to the practicability of proceeding to sea from the roadstead.

MOERANGI BAY.—Look-out bluff (*Awa-mokihi*) is the north point of this bay, Whalers Home point being its southern extreme. The bay is 5 miles in length north and south, and about 2 miles in depth, the coast line being fronted with a sandy beach; Kelp reef nearly 3 miles long, covered with kelp, extends nearly across its entrance from north to south, 1½ miles distant from the beach, and is a great protection to the bay; there is anchorage for coasters, though it would not be prudent to remain with any symptoms of bad weather from the eastward.

LIGHT.—A white tower, 28 feet high, stands on the southern point of Moeraki peninsula, from which is shown, at an elevation of 170 feet above high-water level, a *fixed* white light, visible all round seaward, or as far as the land admits, from a distance of 19 miles.

Whalers Home point, the eastern extreme of a cliffy projection, is nearly 3 miles in length, with sandy coves on its north and south sides, forming good boat harbours. A small islet (White islet) and some scattered rocks, under water, covered with kelp, lie half a mile off the northern part of this projection; and 1¾ miles eastward of its southern extreme is Fish reef, which extends in a north-west and south-east direction for one mile, and uncovers at low water, being well marked at other times of tide by kelp; this reef has deep water close outside it.

The coastal town of Moeraki is situated on the north-western extreme of the peninsula, at which an iron jetty has been constructed, affording a depth of 10 feet at low-water springs.

From Moerangi bay southward, the country is hilly and wooded close to the coast; a sandy bay extends 5 miles, the south extreme of which is Vulcan point. Shoal water extends 2 miles southward of this point, at the extreme of which is Danger reef, a sunken rock, whose position is also marked by kelp. Three very remarkable mountain cones rise just to the southward of Vulcan point, 2 or 3 miles from the coast.

WAIKOUAITI BAY* is 17 miles southward of Whalers Home point, and 9 miles north of Otago harbour. It has a clean sandy beach 2 miles in extent, its southern point being formed by Mistaken islet, close northward of which is the entrance of a small river. There is anchorage in the bay with off-shore winds in 5 fathoms, within half a mile of the shore.

Ahuriri rock lies three-quarters of a mile from the shore, and 2 miles N.E. ½ E. of Jones head, the north point of Waikouaiti bay; it has 5 feet on it at low water, with 2 to 4 fathoms immediately around. From it Remarkable cliff, near Tairoa head, bears S. by E. ¾ E., Vulcan point N. by E., and Harris bluff S.S.W. ½ W.

Caution.—Vessels should not approach this part of the coast between Vulcan point and Jones head within 2½ miles, as it has not been examined near the shore, and is considered foul.

BLUESKIN BAY, between Waikouaiti and Otago harbour entrance, is nearly 5 miles in depth; some rocks, which show, extend off its northern shores for about half a mile; otherwise it is clear of dangers, and has a general depth of from 7 to 10 fathoms. There are several sandy bights on its southern side, which afford good anchorage in southerly or off-shore winds.

SOUNDINGS OFF THE COAST.—A general description having now been given of the coast between Banks peninsula and Otago harbour, a distance of 150 miles, a reference to the chart will show that for 120 miles of the distance, or as far as Moerangi bay, it is free from danger to within 2 miles of the shore, but that Timaru should be approached with caution. The bank of soundings is well defined; and knowing the latitude, a ship's position on approaching the land may be determined with tolerable accuracy. Northward of Moerangi bay from 50 to 60 fathoms sand will be found 30 miles from the coast, and about 30 fathoms at half that distance, decreasing gradually to 10 fathoms at 3 miles from the shore, where the bottom is chiefly gravel and stones. Between Look-out bluff and Otago harbour the only dangers are the Kelp reef (which lies across the entrance of Moerangi bay), Fish and Danger reefs, and Ahuriri rock; all these reefs excepting Ahuriri rock are either visible, or their positions marked by kelp, and do not extend more than 2 miles from the coast.

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* Mr. Jones, a colonist from Sydney, and who was largely connected with the coast whaling establishments throughout the Middle island, carried on a farming and fishing business here for many years, and small vessels frequented it to embark cargoes (1850).

Southward of Moerangi bay the deep water approaches nearer to the coast; at the distance of 20 miles there is 60 fathoms, sand and coral, and at 30 miles no bottom was found with 400 fathoms of line; at 2 miles from the coast there is from 15 to 18 fathoms. Immediately eastward of Otago harbour the 100-fathom line of soundings does not extend beyond 12 miles from the land, and inside that distance it shoals rather rapidly to 30 fathoms; 14 fathoms will be obtained within 2 miles of the entrance.

OTAGO HARBOUR.—The approach to this port from the southward is well denoted by cape Saunders, on which stands a lighthouse, and its remarkable insulated mountain, 1,410 feet high; from the northward and eastward it will be known by the gap its entrance makes in the land, as also, in hazy weather, by a remarkable bank of dazzling white sand heaped at the base of the steep cliffs forming its western entrance head. This bank of sand, from a distant offing, is frequently mistaken for breakers on the bar.*†

LIGHTS.—A light is exhibited from a lighthouse standing on Tairoa head, at the east side of entrance to Otago harbour. It is a fixed *red* light, visible from seaward when bearing from W. ¾ S., through south, to S.E. It is elevated 196 feet above the sea level, and in clear weather should be seen at a distance of 20 miles. The tower, 39 feet high from base to vane, is painted white, the lantern dome being dark green, and forms an excellent beacon by day as well as by night. In thick or foggy weather a gong is sounded every 15 seconds.

Leading lights.—Two leading lights for crossing the Outer bar, are exhibited from two white towers erected on the sandspit at the west side of entrance to the harbour; they are 300 yards apart on a S.S.W. and N.N.E. bearing. From the upper, or inner tower, a fixed *green* light is exhibited 36 feet above sea level; and from the lower, or seaward one, a *fixed* white light 26 feet above sea level. Both lights are visible seaward in clear weather between the bearings of S. 41° E. to S. 34° W. at a distance of 6 to 7 miles.

Pilot station light.—A small fixed *red* light, not visible seaward, is exhibited on the red and white beacon at the Pilot station inside Tairoa head.

Light-vessel.—Inside the Inner bar, a light-vessel is moored in 16 feet at low-water spring tides, on the south edge of the sand-flat extending from the west side of entrance, at a distance of about 2 cables S.W. by S. from the first red beacon.

Signals.—As Otago is a barred harbour, there are times when it would be imprudent and unsafe for vessels drawing more than 16 feet to attempt to enter. To denote the state of the bar the New Zealand General Harbour code of Signals are exhibited from Tairoa head, under the care of an efficient signal master.*

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* *See* Admiralty plan of Otago harbour, No. 2,411; scale, $m = 2 \cdot 0$ in.

† Information on Otago is derived from Notices issued by the New Zealand Government, 1876–1880.

The Commercial code of signal flags is used as required.

Tide signals.—From a flagstaff at port Chalmers, signals are made showing the least depth of water in the southern channel leading to Dunedin, from the first-quarter flood until high water.

Pilots.—An efficient staff of pilots is stationed at Tairoa head, and at all times ready to push out when the bar is passable. Their services are offered to the nearest inward-bound vessel having the pilot-signal flying, (unless another vessel be observed running into danger, in which case every exertion will be made to board and assist the latter vessel), preference always being given to Her Majesty's ships and mail packets.

Pilots board vessels within a radius of 3 miles from Tairoa head, unless the sea on the outer bar renders it unsafe for a boat; this however seldom occurs. If unsafe, then the pilot boat is placed in mid-channel inside the bar and shows the pilot flag, for which the vessel must be steered as soon as the red and white beacon at the pilot station opens out to view. If the wind be strong and northerly the vessel should run in under easy sail, to enable the pilot to board in safety, as there is not room to round a vessel to in the channel.

If the wind be northerly, or if it be necessary to wait for daylight, for tide, or for a pilot, stand off and on, and do not bring the lighthouse to bear to the eastward of South; a vessel will thereby benefit by the northerly current and keep to windward.

Anchorage.—The outer anchorage is safe when there is no easting in the wind. Small vessels should keep as near the line of the leading lights as convenient, in 9 fathoms about half a mile from the shore; and large vessels about 1¼ miles off shore in 15 fathoms, with Tairoa head lighthouse bearing South.

Entrance and Harbour.—The entrance to the port lies north and south. Tairoa, its eastern head, is a bold dome-shaped rocky headland, 244 feet high, with a flagstaff on its highest part. From this head the bar extends in a north-westerly direction towards Hayward point, which is the northern extreme of a bluff precipitous headland, forming the western entrance head of the port.

Within the entrance a spacious sheet of water extends to the south-westward for a distance of 11 miles, and at its head stands the town of Dunedin. Seven miles within the heads a prominent headland, with two adjacent and lofty islands extending across the harbour, form a natural division: above which, the channels leading to Dunedin become either too shoal or too narrow for large vessels prudently to proceed farther.* Immediately north-westward of the Halfway islands is the town of port Chalmers at the head of Koputai bay, where there is good anchorage for large vessels in 5 fathoms; here they discharge cargo, which is conveyed to Dunedin either by the railway or by lighters.

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* For New Zealand General Harbour Signals, *see* page 15.

On a reference to the plan of this harbour it will be observed that, when within the bar, the channel leading to Koputai bay is deep but narrow, extensive sand-banks filling up the central space of both divisions of the harbour. This channel is well marked by a series of beacons and buoys; but a stranger should not proceed without a pilot beyond the first anchorage within the entrance.

The Inner anchorage, between Howlett point and the first buoy on the inner bar, is safe in any weather. For vessels anchoring below Harrington point, the nearer they are to the sand-spit the better; and above the point they should get into the bight a little, abreast the old native village.

Only vessels of a light draught can work into the inner anchorage. When working out on the ebb care must be taken not to stand too close over to Hayward point, as the tide and swell set in that direction: the swell increases as the point is neared, and tends to cause the vessel to miss stays, thereby placing her in a critical position ere she can be brought up. The holding ground is not good; and this bight is dangerous to get into.

BARS.—The Outer bar extends one mile in a north-west direction from Tairoa head; it it composed of hard white sand, and is in parts an extremely narrow ridge, difficult to touch upon with the lead, with a fathom deeper water on either side; the depth of water on it varies, being a little deeper after the winter gales (July and August), which blow from south-west.

The Inner bar is about one mile within the heads above Harrington point, but as there is always smooth water on it, it presents no obstacle to navigation.†

The harbour should not be approached in a south-east gale, for these winds set the heaviest sea in on the coast, and produce a frightful surf on the bar, which breaks in 5 and 6 fathoms; neither should the bar be attempted on the ebb tide, unless with a commanding breeze, as it sets strongly towards Hayward point. Light south-easterly winds also, which are generally accompanied by a light sea fog, cause a troubled swell on the bar, which is not the case with those from north-east, to which quarter it is more exposed. A strong north-east wind with the ebb tide makes a broken bar, dangerous for boats, but the swell goes down at all times very quickly, particularly with westerly winds.

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* "A new channel in the upper harbour has recently been cut through the sand-bank with 18 feet water in it, so as to enable the largest vessels to reach the Dunedin wharves, for which a steam tug is necessary and always obtainable."—*Brett's New Zealand Pilot*, 1880.

† "There is now more water on both bars than formerly; the deepest and best part for crossing is distant 2¼ cables from Tairoa head. The depth of water at present (1880) in the channel across the Outer bar is 16½ feet at low-water spring tides, and across the Inner bar, 27 feet." *Brett's New Zealand Pilot*, 1880.

Directions.—To enter at night bring the two leading lights on the sand-spit in line S.S.W. and steer on this course across the bar (the crossing of which will be detected by the rapid deepening of the water and its smoothness), until the small *red* light at the pilot station inside Tairoa head opens out; then steer for Harrington point, the first rocky point half a mile within Tairoa head, which may be passed at half a cable, being quite steep-to; or midway between it and the low dry sand-spit on the opposite shore, continuing a mid-channel course between the buoys on the inner bar—leaving the red buoys on the starboard hand, and the black on the port—and passing the lightship on the starboard hand about 70 yards distant. Having passed the lightship, steer direct for the bright *fixed* light that is shown in Dowling bay, care being taken in sailing up to judge the distance of the light, so as to keep the channel—which at Dowling bay curves to the south-west,—and thereby avoid running into the bay. The channel thence to Dunedin is well marked by buoys and beacons, red on the starboard side and black on the port, the red beacons at night having bright fixed lights on them.

According to a survey made by order of the Otago Harbour board, in March 1879, the least water on the bar of that harbour, with the leading lights in line bearing S.S.W., was 15 feet at low-water ordinary spring tides.

The *green* light open north of the white light, and bearing S. by W. ¾ W., leads across the bar in 16 feet.

Caution.—It should be observed that the depths on the bar of Otago harbour are subject to change.—For some years there was reported to be not less than 18 feet at low water, but the great tidal-wave of August 1868, suddenly reduced the depths to 12 feet. After that date the bar slowly resumed its original depth, so that in February 1871 there was stated to be again 18 feet in the channel across it, and according to information published by the local authorities, the same depth was maintained in 1876.

The depths in the north channel are also reported subject to change.

Current.—With southerly winds, a current in the vicinity of the entrance to Otago harbour is experienced, setting to the northward at the rate of from one to 2¼ knots an hour.

It is recommended that only small vessels and steamers should venture across the bar at night, without a pilot, unless in case of necessity.

North channel.—It must be observed that in smooth water, with a commanding breeze, there is an available channel within the bar, between it and Hayward point, where formerly there was a depth from 22 to 25 feet; but the least water found (March 1879) in this channel, was 19 to 20 feet at low-water ordinary springs. Vessels intending to take it should bring the entrance of the harbour, between Harrington point and the low sandspit opposite it, open on a S.E. ½ S. bearing, and steer in on this course until abreast of the black buoy, moored in 19 feet at low water, marking the western extremity of the bar, passing it close-to; then haul up for Tairoa head until abreast of the first red buoy in 17 feet at low water, passing it close-to on starboard hand; a sharp curve must then be made on rounding this buoy, passing close to the second red buoy, steering midway between Harrington point and the sandspit, and then proceed as before directed. In taking this channel vessels are generally exposed to the swell abeam.

Driver rock is the only danger outside the line of the bar, with 7 feet on it at low water. It lies N.E. by E., 1⅛ cables from the north-east extreme of Tairoa head, and is out of the track of vessels crossing the bar, but dangerous for small vessels hugging Tairoa head on that bearing.

From information derived from the pilot, it is considered that the bar is impracticable for shipping about 40 days in the year, and that during the winter months it occasionally has continued so for a fortnight consecutively.

TIDES.—It is high water, full and change, at Tairoa head at 2h. 50m.; in Koputai bay at 3h. 30m.; and at Dunedin at 4h. 30m. "The rise of spring tides at the heads varies from 4 to 7, and sometimes 8 feet; at port Chalmers, 3½ to 7 feet; and at Dunedin from 4 to 6¾ feet. At the latter place the flood lasts 5h. 12m., and the ebb 6h. 42m.

The average interval of slack water at port Chalmers is 25 minutes; and at Dunedin, 17 minutes."*

With northerly winds and fine weather there is little flood stream, with a rise not exceeding 2 feet. The greatest strength of the tide is in the narrow passage abreast Harrington point, where the ebb runs from 2 to 3 knots, and the flood somewhat less; on the bar the greatest rate is 2 knots.

There is very little interval of slack water at the entrance of the harbour. The flood runs 5h. 20m., and the ebb 7h. 0m., the latter beginning 0h. 40m. after high water, and the former 1h. 40m. after low water. In the upper part of the port the ebb and flood are of about the same duration, the greatest velocity 2 knots on the ebb, and 1½ knots on the flood.

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* Marine Department.

The capabilities of the port of Otago could not be better shown than by the fact that the ship *Achilles*, of 1,520 tons register, drawing 21½ feet of water was on the 3rd of July 1870 safely piloted into this harbour, and anchored at port Chalmers in the dark; also, that only three wrecks have occurred at the entrance since the formation of the settlement. As these wrecks, with ordinary management, might have been avoided, they cannot be received as evidence that the entrance to this harbour is dangerous, and it is stated that a larger amount of shipping has visited Otago harbour, and fewer casualties have happened therein, than in any of the other principal ports of New Zealand.

Dredging.—Extensive dredging operations, between port Chalmers and Dunedin, have been in progress during the past few years. In 1879 a depth of 9 feet had been attained, whilst in October 1880 the cutting afforded a depth of 14 feet, which it was anticipated—on the expiration of another 6 months—would be completed to admit of vessels drawing 18 feet water proceeding to Dunedin. An extensive system of harbour works at Dunedin is in contemplation, which includes wet docks, etc. Its railroads extend in every direction, connecting with Christchurch on the north; the Bluff, Invercargill, and Riverton on the south.

Docks.—The graving dock is situated in Koputai bay at port Chalmers, and capable of taking any vessel likely to enter Otago harbour, until the bar entrance deepens considerably.*

Dimensions of dock:—Length over all, 330 feet; breadth of entrance, 68 feet; depth over sill at ordinary spring tides, 21 feet.

There is also a floating dock and a patent slip, both capable of taking vessels of 600 tons. The floating dock is 170 feet long and 42 feet broad, with a depth on sill, when sunk, of 11 feet.

Piers.—The railway pier at port Chalmers is 1,000 feet long, and vessels of 2,500 tons have discharged alongside it. It has berthage for six large ships. Another wharf, running parallel to the first, has been constructed, with accommodation alongside for five other vessels. The space between the latter wharf and the shore westward of it, is being reclaimed for the purpose of affording sites for goods sheds, &c.

Time-ball.—A time-ball is dropped daily at noon.

Quarantine.—The buildings intended to form a quarantine establishment are in course of erection, 1872, on the Halfway islands.

This being the wool season (November), no less than nine fine merchant vessels are loading in this harbour, portions of their cargoes being brought down from Timaru, Oamaru, and other roadsteads on the east coast of the island. Flax and preserved meats are the other principal exports.

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* In May 1882, dredging operations were being carried out in the channel over the bar at Tairoa head.

COAST from OTAGO to NUGGET POINT.—From Tairoa head the coast runs S.S.E. nearly 7 miles to cape Saunders;* this bold and remarkable headland is the south-eastern termination of the peninsula which forms the southern side of Otago harbour.

LIGHT.—Near cape Saunders stands a white lighthouse 28 feet high, from which at an elevation of 210 feet above the sea is exhibited a *revolving* white light, attaining its greatest brilliancy *every minute*, visible from seaward between the bearings of N.E. ½ N., through north and west, and S.W. by W., and in clear weather should be seen from a distance of 20 miles.

From cape Saunders the land trends away S.W. by S. in a curvilinear form towards Quoin point, a rounded projection 28 miles distant. The intermediate coast forms a deep bight, the land being moderately high, and in some parts thickly wooded.†

The off-lying rocks and islets in this bight are, first, Gull rock, the outermost of a cluster, standing nearly one mile from a cliffy head, 3¾ miles south-west of cape Saunders light. At 6¼ miles W.S.W. of Gull rock, and a mile from the coast, is White islet; and at the same distance from the shore, 5 miles further westward on the same bearing, is the small Green islet. On the coast midway between these two islets is Black head, a rather remarkable rocky head, and immediately within rises the well-named Saddle hill of Cook.

From Black head the coast is low, curving with a shingle and sandy beach for 12 miles to Taieri river, which is navigable at its entrance for vessels of from 6 to 9 feet draught, and is 24 miles from cape Saunders. Its north entrance point projects half a mile to the eastward, and is formed by a small island of the same name. The coast now rounds away 6 miles southward to Quoin point, with rocky ledges extending about half a mile off shore. Cook's head, a remarkable rock on the beach, is 4 miles south-westward of Quoin point.

NUGGET POINT, 22 miles from Quoin point and 50 miles from cape Saunders, is the southern extreme of Molyneux bay. It is a bold projecting headland, the termination of a remarkable razor-backed mountain ridge, with three pointed rocky islets standing nearly half a mile off it.

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* About one mile from the south point of Wickliffe bay, which is midway between Tairoa head and cape Saunders, a reef, with less than 6 feet water on it, on which the ship *Hydra* struck at low water, was reported in 1868.

Hydra reef has been unsuccessfully searched for by local pilots and is not considered by them to exist.

† *See* Admiralty coast chart, Otago to Mataura river, sheet X., No. 2,533: scale, *m* = 0·3 of an inch.

LIGHT.—The lighthouse stands on the extremity of Nugget point, and is a stone tower, 31 feet high, painted white; it exhibits a *fixed* white light, elevated 250 feet above the sea level, and in clear weather should be seen 23 miles.

MOLYNEUX BAY.—Anchorage may be obtained in this bay with off-shore winds, in 8 fathoms, about half a mile off the landing-place, and the same distance northward of Reef point; this point is little more than 2 miles N.W. of Nugget point, with a reef of rocks extending three-quarters of a mile from it. Coal is found in a cliff on the north side of this bay, 7 miles from the mouth of the Clutha river: on either side of this river are extensive clumps of wood.

Clutha river (*Matau*) runs into Molyneux bay 4½ miles north-westward of Nugget point; this is a considerable river with deep water, and broad within the entrance, but a constant fresh running out at the rate of from 3 to 5 knots renders the narrow entrance unfit for anything but boats, when it must be taken at or near high water; the bar is rocky and dangerous, still it is possible that small steamers might navigate the river with advantage.*

Current.—Between cape Saunders and Nugget point, a current of one knot an hour is generally found to set to the northward.

Soundings.—The 100-fathom line of soundings extends 20 miles from the coast, and decreases regularly towards the shore; at the distance of 2 miles there are 12 fathoms, sand. Large vessels, however, are not recommended to stand in nearer than a league.

COAST from NUGGET POINT to FOVEAUX STRAIT.—From Nugget point the coast trends S.W. by S. 13 miles to Long point; thence S.W. ½ W. 10½ miles to Chasland's mistake, and from the latter W.S.W. 12½ miles to Slope point. Southward from Nugget point the coast becomes much broken, with occasional islets and reefs, which, in the absence of any regular anchorage, prove of great benefit as places of refuge to the boats engaged in the whale and seal fisheries. It is not uncommon for whale boats to make the passage from Stewart island or the north shores of Foveaux strait, to Otago, a distance of 140 miles, taking advantage of these boat harbours on the approach of bad weather, which on this coast is of frequent occurence.

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* "The Clutha, during a heavy flood in 1879, opened out a second entrance nearer Coal point, which continues open still, the result being that the old entrance shoaled considerably; the river waters therefore being now divided, have caused both entrances to be shallow and very dangerous." *Harbour-master, Dunedin, August* 1880.

Three miles southward of Nugget point is False islet, connected with the mainland by a sandy neck.

Catlin river is 1½ miles westward of False islet, and navigable for small vessels; the bar, on which is a depth of 5 feet at low water, breaks with a swell from north-east to south.* High water, full and change, 2h. 30m.; springs rise 8, and neaps 4 feet; strength of tide, 2 to 3 knots, both ebb and flood. The flood stream runs in for 50 minutes after high water. The township of Newhaven stands on the north bank of the river, half a mile inside the bar, where the channel is one-third of a cable wide. One and a half miles southward of Catlin river is the small islet of Tuawike, close to the shore; inside is a boat harbour. White head, a bold cliff, is 1½ miles to the southward of it.

Long point (*Irihuka*) is the next projecting headland; it is similar in character to Nugget point, but without the rocky islets off it. Two miles north-eastward of it is Cosgrove island, inside which there is landing in fine weather. Abreast this part of the coast, at 2 miles from the shore, there is a depth of 25 fathoms over a bottom of fine sand, and between 50 and 60 fathoms at the distance of 5 miles; in coming from the northward, the influence of the Foveaux strait tide commences to be felt here. The coast now trends more to the westward.

Tautuku, a sandy bay, 6 miles in length, sweeps round from Long point; at its south-western extreme is the river of the same name, a rapid stream, with a bar dry at low water. There is anchorage off it, in 7 and 9 fathoms, with westerly and north-west winds, but exposed to south-west: a boat harbour is situated at the north-eastern end of the bay, sheltered by Long point. The land over this part of the coast is a series of irregular hills, rising over 1,300 feet, with rounded outline, and diminishing both in height and ruggedness of appearance to the northward.

Chasland's mistake (*Makate*), a rather remarkable black cleft cliff, is nearly 11 miles from Long point, and has a high rock standing off shore a mile to the north-east of it.

Brothers point, which has two rocky islets standing off it, is nearly 6 miles westward of Chasland's mistake, the coast forming a bight between them, in the centre of which is a boat harbour, and also another close westward of the point itself.

Waikawa river, with 3 fathoms on its bar at low water, but a very narrow entrance, and strong freshes always running out, is 3 miles westward of Brothers point; just to the eastward of its entrance is a white bluff, on which it is *proposed* to erect a lighthouse. Small vessels have laid secured to the shore within the river, but exposed to considerable danger from the freshes and also the swell from southerly gales.

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* *See* plan on Admiralty coast chart, sheet X., No. 2,533; scale, $m = 6 \cdot 0$ inches.

From Brothers point the coast decreases in elevation, and is backed by a range of undulating hills, apparently well adapted for pastoral purposes. The tide of Foveaux strait slackens considerably off this part of the coast, and there is a longer stream to the north-eastward.

Slope point.—At 5 miles westward of Waikawa river is Slope point, the southern extreme of the Middle island of New Zealand; this is a low treacherous point, the sea breaks for more than one mile off it; it is only remarkable from the sloping mountain rising to 1,315 feet, 7 miles to the northward.

Waipapapa point, 7¼ miles westward of Slope point, is low and sandy; between Waikawa river and this point the coast is fronted with numerous rocky ledges, which render it imprudent for vessels to approach within a league; its exposed character and irregular tides render it also unsafe for boats, unless in very fine weather.

Waipapapa point is the eastern extreme of Totoes bay; it slopes gradually down to the sea from a mountain summit, 14 miles to the north-east of it. The sea is said to break heavily at times 5 miles off this point, in 7 and 10 fathoms; it should therefore be approached with great caution.*

Mataura river.—At 5 miles north-west of Waipapapa point in the bight of Totoes bay, is the entrance of this river, with only 2 feet on the bar at low water. It drains a large extent of valuable country, and near its junction with the sea overflows a considerable quantity of the land.

Between Mataura river and Waipapapa point, the Papanui, a mountain stream, runs into the bay through a line of cliffy heads. From Mataura river to the Bluff harbour, a distance of 18 miles, the coast line is a low sandy beach backed by an extensive plain, the hilly country terminating at the eastern bank of the river.

GENERAL REMARKS.—It will now have been noticed, that from Otago harbour to Waipapapa point, which may be considered as the north-eastern entrance point of Foveaux strait (a distance of about 110 miles), there are no dangers which extend more than one mile from the shore, and very few which do not show; neither can there be said to be any very remarkable features by which the seaman may be enabled to ascertain his exact position. Nugget point, with its lighthouse, and Molyneux bay are conspicuous landmarks, particularly the latter, which shows as a deep bight from seaward, the land on either side of it being moderately high.

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* The soundings, off Waipapapa point, obtained by Commander Edwin, R.N., in 1873 confirm its dangerous character.

Long point, Chasland's mistake, Brothers, Slope, and Waipapapa points, though not very remarkable, may, with the assistance of the chart, be recognised at the distance of 5 miles: the water shoaling also gradually, as it does, within the 100-fathom line, 20 miles from the shore, will enable a vessel to judge her distance from the coast at night with tolerable accuracy.

CHAPTER VIII.

FOVEAUX STRAIT, AND SOUTH OR STEWART ISLAND, INCLUDING THE TRAPS ROCKS AND SNARES ISLANDS.

VARIATION IN 1883.

Bluff harbour	16° 25′ E.	The Snares	16° 35′ E.

FOVEAUX STRAIT separates the Middle, from the South or Stewart island, and lies in a W.N.W. and E.S.E direction; the general width is 15 miles. From Ruapuke island to the north-west end of Stewart island, a distance of 30 miles, it has a depth of from 15 to 28 fathoms over a sandy and shell bottom.*

Ruapuke island, lying nearly in the centre of its eastern entrance, and surrounded in almost every direction by islets, reefs, and tide ripplings, renders the approach from the eastward, unless in moderate weather, rather formidable to a stranger; there is, however, a clear passage on either side of it 5 miles in width, and with not less than 12 fathoms water.

The northern shore of the strait also, from Bluff harbour to the western end of Tewaewae bay, a distance of nearly 50 miles, is studded with islets and reefs, some of which extend 8 miles from the coast, and are not always visible; but notwithstanding these dangers, Foveaux strait has a clear navigating width, westward of Ruapuke island, of never less than 10 miles.

The greatest difficulty the seaman has to contend with is the extremely boisterous weather which this part of New Zealand is constantly subject to; gales from south-west to north-west, but more frequently from the latter direction, blow with more or less violence, and without regard to seasons, throughout the whole year, frequently continuing without intermission for many days, and then lulling for a few hours only to return with renewed violence. Vessels passing through the strait to the westward are sometimes weeks getting round the south-west extreme of the Middle island, which is barely 100 miles from the eastern entrance; it is useless for a sailing vessel to attempt it, unless with a slant of wind, and a vessel bound this way is therefore recommended to remain at anchor in port William or Paterson inlet,—on the eastern side of Stewart island,—until one occurs; indeed whalers or sealers bound to their fishing grounds and who visit the ports of Stewart island for refreshments or to refit, are almost the only vessels that attempt to pass through Foveaux strait to the westward.

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* *See* Admiralty coast chart, Foveaux strait and Stewart island, sheet XI., No. 2,553; scale, *m* = 0·3 of an inch.

Current.—There is also another difficulty to be encountered, which is, a current always setting to the southward round the south-west extreme of the Middle island; having once rounded this point, a south-west wind will carry a vessel in a short time into comparatively finer weather, but it is not an uncommon circumstance for a sailing vessel,—her fair wind falling before rounding this extreme,—to be set back by the current, overtaken by a north-west gale, and obliged again to bear up for Stewart island, which undoubtedly is the wiser course if the gale proves to be severe; it saves much wear and tear as well as anxiety. After passing Saddle point of Stewart island, smooth water will immediately be found, port William always accessible, and anchorage may be had anywhere off the coast between it and Saddle point.

Although the passage through Foveaux strait from the eastward cannot be recommended for any but steam vessels, it may be convenient for vessels from the westward bound for Otago, or the Canterbury settlements, or indeed from the Australian colonies to England, to make the passage through this strait; and from the westerly winds so constantly prevailing, it could be accomplished with great rapidity in smooth water, and those ugly dangers, the Traps rocks southward of Stewart island, avoided.

SOLANDER ISLAND.—Ships entering from the westward should make this island, which is an excellent landmark, indeed a perfect finger-post to the strait; it lies 22 miles south of the southern coast of Middle island, and W. ½ S. 35 miles from the north-west end of Stewart island. It is nearly one mile in length, rises almost perpendicularly from the sea, and has a remarkable peaked summit 1,100 feet high, which in clear weather can be seen 13 or 14 leagues; adjoining it is a smaller islet lying little more than one mile to the westward.*

By arranging to pass Ruapuke island,—distant 65 miles from Solander island,—with daylight, vessels may make this passage without difficulty, and often with considerable advantage.

The only port on the northern shore of Foveaux strait eligible for ships of burthen, is Bluff harbour (*Awarua*); its narrow entrance and very strong tides render it, however, at all times difficult of access to sailing vessels, although the extensive and magnificent plains which stretch from it without interruption for 80 miles to the northward, must render it a place of considerable importance now that steam navigation is introduced. Besides this anchorage, there are New and Jacobs rivers, the former eligible at certain times of tide, and in fine weather for vessels drawing 13 to 15 feet water; and the latter for smaller craft, the bar being nearly dry at low water.

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* The light on Centre island (*see* page 286) is now at night time the chief guide for making Foveaux strait from the westward.

On the Stewart island shore there are several ports which are always accessible and safe, and where vessels may wait for an opportunity of entering Bluff harbour or New river.

Having now offered these general remarks on Foveaux strait, a more detailed description of its coasts, harbours, and dangers will be given.

RUAPUKE ISLAND,* as before remarked, lies nearly in the centre of the eastern entrance of the strait, its north point being in a direct line between the low sandy Waipapapa point on Middle island, and port William in Stewart island, bearing from the former S.W. ¾ W. 14 miles, and from the latter N.E. ¾ E. nearly 19 miles. It is a low island of an irregular shape, 4½ miles long in a north and south direction, and 3 miles wide, and may be seen from a vessel's deck at a distance of 12 or 14 miles; the central part is 140 feet high, and thickly covered with trees of stunted growth; the north point is a cliffy headland, with a hummock over it 220 feet above the sea. The principal dangers lie off the eastern side of the island.

Green island is 1½ miles in circumference, 190 feet high, and has a level outline. It lies nearly one mile east of Observation bluff, the eastern cliffy point of Ruapuke island; between them is the anchorage.

Seal rocks, to the north-eastward of Green island, are high out of water, the dry part covering a space of 2 cables; reefs awash extend from them to the westward nearly three-quarters of a mile, and also to the south-eastward 4 cables; between these rocks and Green island there is a clear passage of three-quarters of a mile, with from 9 to 15 fathoms water. A sandy ridge, least water 3½ fathoms, extends one mile from the western extreme of the Seal rocks towards the north head of Ruapuke island, on which the sea occasionally breaks in heavy weather.

Toby rock is the most dangerous in the neighbourhood; it is only awash at very low springs, and is not marked by kelp, as most of the dangers here are; it lies directly in a line with the north end of Green island, and the high part of the Seal rocks, bearing N.N.E. ¾ E. distant 1½ miles from the latter, and E. by N. ⅝ N. 3¾ miles from the north head of Ruapuke island.

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* *See* Admiralty plan of Ruapuke island, on coast chart, Otago to Mataura river, sheet X., No. 2,533; scale, *m* = 2·0 inches.

Fairchild shoal is a rocky patch, which only breaks in heavy weather, extending half a cable in a north-west and south-east direction, and has over it a depth of 4 fathoms with from 7 to 12 fathoms around, it lies with the following bearings :—Green island, east extreme S.W. by S., distant 4½ miles; Toby rock (awash) S.W. ¾ W., 2 miles; Ruapuke island north head S.W. by W. ¾ W., 5¾ miles ; and Dog island lighthouse W. ½ N. 11½ miles. When on the shoal the bottom, being white, is easily seen.[*]

This locality, where heavy breakers are reported, should be approached with great caution.

Directions and Anchorage.—Vessels from the eastward, intending to anchor at Ruapuke island, should pass 5 to 6 miles southward of Waipapapa point; and when abreast it, the island will be generally visible. Green island and the Seal rocks will be plainly made out at the distance of 6 or 7 miles, when a course may be steered direct for the former, which will lead clear of all dangers. When within half a mile of Green island, haul round the northern point giving it a berth of a quarter of a mile in 11 fathoms, and anchor midway between it and Lee islet —which lies close off the north-east sandy point of Ruapuke—half a mile from either in 5½ fathoms, sand bottom. Vessels should not go within this line, as several rocks and reefs, marked by kelp, extend half a mile from the beach, and break in bad weather. Weather islet lies half a mile south of the anchorage, midway between Green island and Observation bluff.

With westerly or south-westerly winds this anchorage is safe, and has smooth water, but with strong southerly winds a swell rolls in. The Seal rocks and reefs, with Green island, protect it in a measure from easterly winds, but vessels should not lie here with these winds, when better anchorages can be found in the bays on the west side ; indeed with the safe and excellent harbours of Stewart island so near, there could be no inducement for a vessel to ride out a gale here, unless in a case of actual necessity.[†]

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[*] Marine Department, Wellington, June 1882.

[†] H.M. Surveying vessel *Acheron* rode out a very severe gale at Ruapuke anchorage, with three anchors down and steam up, between the 19th and 22nd of March 1850. On the 19th at noon the barometer fell from 29·65 to 29·43 inches, and the wind, which had been light from north-west, shifted to west and south-west, and rapidly increased to a gale, the mercury rising or falling as the wind lulled or increased in violence, which it did alternately until the 20th, when the barometer fell steadily, and at 5 p.m. of the 22nd, it was down to 28·46, then blowing a hurricane ; from this time the barometer rose gradually, and the wind quickly moderated, and continued from south-west until the 25th. This was an exceedingly strong gale, and a heavy sea rolled into the anchorage from the southward,

From this anchorage, there is a passage to sea between the Seal rocks and Ruapuke; vessels going out this way should pass about half a mile from Lee islet, and between it and the 3½-fathom sand ridge (before mentioned) extending westward of the Seal rocks. A heavy tide race extends a quarter of a mile off the north head of Ruapuke; it is otherwise free from danger.

Landing.—The landing for boats is close round Observation bluff, where there are some native houses. There is also a missionary station 1¼ miles southward of the bluff in a sandy cove.

Breaksea isles, two in number, surrounded by rocks, lie 1½ miles off the missionary station, and a mile south of Green island. Two reefs above water or awash, lie a short distance to the westward and south-westward of the isles.

Three rocky islets extend half a mile off the south point of Ruapuke, they are known as the South islets.

Kelly rock, not marked by kelp, only breaks occasionally, and lies nearly a mile S. by E. ¾ E. of the southern extreme of the South islets, and 1¼ miles E. ½ S. from a remarkable black rock, the easternmost of the Hazelburgh group.

Outlying islets and rocks.—Between the south and west points of Ruapuke island is Henrietta bay, and off these points, extending for a distance of 4 miles in a semicircular form, are the Hazelburgh group, Half-passage and Fife rocks, and Bird island, together with several smaller patches inside and among them, which generally break; vessels, unless coasters acquainted with the locality, should not go within the line of these islets and rocks.

Henrietta bay.—On the occasion of the visit of H.M.S. *Brisk*, in 1867, to Ruapuke, a fresh easterly breeze was blowing, making it undesirable to anchor in the eastern roadstead, she therefore passed to the southward of the Hazelburgh group, and proceeding between it and South islets, anchored in Henrietta bay in 9 fathoms.

The channel between Hazelburgh group and South islets appeared perfectly clear, no soundings being obtainable with the hand lead, but in hauling into Henrietta bay the islets at its southern entrance should not be rounded too close, as the rocky patch on their north side appears to extend somewhat further in a north-westerly direction than shown on the chart.

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quite breaking over the small islets that sheltered it at other times in that direction. Beyond the low barometer and the cloud-capped mountains on Stewart island there was nothing to indicate the approach of this storm; the *Acheron* at the time was close off the Bluff harbour's mouth, with a light north-west wind, when she was suddenly struck by this gale, and with such violence that it was thought she would have been blown out of the strait, and not be able to regain Ruapuke anchorage.

There is a [illegible] village at the [illegible] corner of Henrietta bay, [illegible] landing place on the sandy beach.

The [illegible] side of Ruapuke island is tolerably free from dangers, with the exception of [illegible] shoal, which lies [illegible] of West point, with a [illegible] and another small shelf lying nearly half a mile off the west point of Caroline bay.

Caroline bay, on the north-west side of the island, is [illegible] miles south-westward of the north head. It has a depth of [illegible] and [illegible] fathoms, with a large rock [illegible] in the centre, inside of which there is [illegible] fathoms.

It is to be observed that although Ruapuke island has so many dangers near it, the greater part of them are above water. Toby and Kelly rocks are alone those that do not show; a strict look-out, however, is indispensable to ensure the safety of vessels navigating in its vicinity, and, unless intending to anchor, it is recommended not to approach within 4 miles in any direction, except on its north-west side, and towards the north head where it may be safely approached within half that distance.

Tides.—It is high water, full and change, at Ruapuke island at [illegible]h. 0m.; springs rise [illegible] feet, and neaps 4 feet. A mile eastward of Toby rock the easterly or flood stream commences [illegible] hours after it is low water by the shore, or at [illegible]h. 0m. on full and change days, and like the westerly stream, is of 6 hours duration, running at the rate of from one to 1½ knots.

EASTERN ENTRANCE of FOVEAUX STRAIT.—

Approaching the strait from the eastward, there are passages northward and southward of Ruapuke island; either may be taken, according as the winds or circumstances may render desirable.

NORTHERN PASSAGE.—Passing along the south coast of the Middle island, at a convenient distance of 4 or 5 miles, the remarkable and solitary hill called the Bluff will be seen in clear weather 35 miles from a vessel's deck, or when abreast of Slope point.

This singular coast feature, which makes like a small islet, is 860 feet high, rising suddenly from the western entrance of, and overlooking the harbour of the same name.

From abreast of Waipapapa point, steer for the Bluff when it bears W. ½ N., allowing for the streams of tide which here run east and west (true) about one knot an hour; this course leads one mile north of Fairchild shoal, 2 miles north of Toby rock, and 3½ miles from Ruapuke island. Vessels from the eastward should not bring Dog island to bear to the northward of West, until Green island bears S. by W. ½ W. When the north end of Ruapuke island bears South, port William in Stewart island will be distant 21 miles on a south-west bearing, which leads to the northward and westward of all the islands; if not bound there but through the strait, steer from the same position off Ruapuke, W.S.W., or for the high range of mount Anglem, on the northern end of Stewart island; this course will lead a vessel 2 miles southward of Dog island, a low islet, marked by a lighthouse, lying to the south-eastward of Bluff harbour, with shoal water extending 2 miles eastward of it, where the sea breaks heavily, and in the neighbourhood of which the tides run from one to 3 knots.

When the Bluff summit bears North, a direct West course through the strait takes a vessel 4 miles northward of Stewart island, 10 miles north of Solander island, and 11 miles southward of the Middle island. In working through Foveaux strait, a vessel should not stand to the northward into less than 20 fathoms, between Bluff harbour and Pahia point, to avoid the reefs in the neighbourhood of Centre island (*see* p. 287); this will leave a clear working width of 10 miles, though it is not recommended to approach within 3 miles of White rocks or Rugged islands, at the north-west end of Stewart island, on account of the heavy westerly swell and tide ripplings which are generally met with there. The Mid-bay reef in Tewaewae bay, on the north shore, must also be avoided; it lies in a line between the points of the bay, 4½ miles from the western Sand-hill point, and only breaks occasionally.

Should a calm be met with in the strait, if not to the westward of Pahia point, vessels may anchor with a kedge in from 18 to 25 fathoms, and thereby avoid being drifted back with the tide; there is also anchorage in Tewaewae bay in from 9 to 13 fathoms, but a vessel should leave immediately a breeze springs up. After passing Pahia point, the water deepens to 30 fathoms, and shortly to 60 fathoms, and the strength of the tides diminishes considerably.

When abreast Solander island, a vessel may shape her course according to circumstances, the current before noticed as setting to the southward, round the south-west extreme of the Middle island, will not be much felt at the distance of 10 or 12 miles from the coast.

SOUTH PASSAGE.—Vessels from the eastward bound to any of the ports of Stewart island would probably pass to the southward of Ruapuke island, in which case they have only to give it a berth of about 4 miles, and when abreast and 2 miles off Hazelburgh group, shape their course accordingly.

If intending to pass through the strait by this passage, the channel, which is 5 miles in width, with from 15 to 18 fathoms water, lies between Hazelburgh group, Half-passage and Fife rocks, extending off the south-west side of Ruapuke; and the group fronting port William and Paterson inlet on the eastern side of Stewart island. Having passed about 2 miles southward of Hazelburgh group, and brought the Half-passage rock to bear N. by W. steer W.N.W. or a mid-channel course until the Bluff summit bears North; a vessel will then have passed through clear of the islands on both sides, and the course should then be altered to W. by N. ½ N. for 15 miles, when mount Anglem will bear S.S.E., and White rocks, 20 feet high, near the shore S.S.W. distant 5 miles. The channel course will then be West, and 40 miles in this direction should place a vessel abreast of Solander island, and nearly midway between it and the south coast of Middle island.

Tides.—The flood tide sets through Foveaux strait from west to east, and is strongest between Bluff harbour and Ruapuke island; its influence is felt as far as Long point, 45 miles eastward of that island. Between Ruapuke and Stewart island it sets to the south-eastward, running parallel with the shores of the latter. The ebb takes an exactly contrary direction.

It is high water, full and change, in the western entrance of Foveaux strait, that is, between the north point of Stewart island and Pahia point, at 12h. 15m.; the flood stream commencing from half an hour to 2 hours after low water, according to the winds, it being earlier with those from the westward.

Both the ebb and flood streams run for 6 hours. At the eastern entrance of the strait, it is high water at 1h. 0m.; the flood stream commencing at 10h. 0m., or 3 hours after low water.

Along the north-east side of Stewart island the flood or south-easterly stream runs one hour and 20 minutes after it is high water at port William, or until 2h. 0m., on full and change days. The strength of the tide varies from a half to 2½ knots; in the narrow part of the strait, between Ruapuke and the Bluff, it is 3 knots.

WINDS, &c.—Irrespective of local influences, the prevailing winds on the southern coasts of New Zealand are from north-west to south-west; and it is not surprising, when the direction of Foveaux strait is considered (W.N.W. and E.S.E.), and its comparatively narrow entrance, that it should have a tendency to invite these westerly gales, or what would be no more than an ordinary gale or strong breeze 100 miles at sea, should blow through the strait with increased violence. The contrary, however, occasionally happens, and outside Solander island it will be a strong gale, when within it, and near the mouth of the strait, the weather is quite moderate.

It has been remarked that westerly winds prevail during all times of the year; such is the result of observations made in H.M.S. *Acheron* during parts of a summer and winter, and likewise of information obtained from several intelligent seafaring men, who have lived for many years in the neighbourhood, some of them owning and commanding whaling schooners built in the country. The following remarks are from both sources.

The fall of the barometer indicates a north-west wind, and frequently dirty rainy weather; these gales blow with great violence, generally lasting 4 or 5 days together. Thunder, which is not of common occurrence, is said to be a sign that the gale will be of unusually long duration; it frequently continues to blow very hard after the mercury has risen, and with a high barometer, but the wind then generally veers to the southward of west. With a strong westerly or north-westerly wind in the strait, it is often south-west in port William, or on the eastern shores of Stewart island, while on the western coasts the north-west wind generally draws from N.N.W., or even more northerly.

A casual north-east or easterly wind, with fine weather, in the eastern entrance of the strait, almost certainly turns to north-west as the western entrance is approached. The only wind to be depended upon to carry a vessel through is a south-easter, which may be looked for, during summer, about once in 6 weeks. In the winter season, June, July, and August, it is more prevalent, and perhaps occurs twice in that period: it generally lasts from 24 to 48 hours, more than sufficient to carry a vessel round the south-west extreme of the Middle island into comparatively fine weather. It is frequently a south-west wind, with fine weather, to the northward of the West cape, while blowing a north-west gale, with dirty weather in the strait.

The barometer rises before south-east winds, and they often blow with great strength. A thick bank of clouds rising to the south-east, with rainy weather, and the hills clothed with a white mist nearly to the horizon, are considered by those acquainted with the strait as certain indications.

Before a south-easter also, the groups of islands between Ruapuke and Stewart island appear much raised by refraction, but on going westward, should Solander island appear distorted beyond its usual dimensions, a westerly wind will certainly terminate the career of the easterly.

It may be observed that the resident whalemen seldom attempt to work their best vessels through against a westerly wind, and H.M. steam-ship *Acheron*, with a sailing vessel employed as her tender, had abundant evidence of the difficulty of getting to the westward during the survey of the strait in 1851.

ASPECT of COUNTRY.—The remarkable hill or headland which rises immediately over the entrance of Bluff harbour, and which has been so frequently mentioned in the description of Foveaux strait, forms a conspicuous and striking feature, contrasted with the great extent of level land in its vicinity, and it may be said to be to the eastern entrance of the strait what Solander island is to the western, a most useful and unmistakeable landmark. It stands at the south-east extreme of a narrow and irregular-shaped promontory, which forms Bluff harbour on its southern side, and the entrance to New river on its northern, these two ports being separated from each other by a low neck.

From the summit, which is 860 feet above the sea, a magnificent view may be obtained. Seaward, looking easterly, the coast line is seen nearly as far as Brothers point. To the south-east, Ruapuke island and the extensive groups of rocks and islands which stretch from it across to Stewart island. To the southward, the shores of Stewart island, from port Adventure on its eastern side, to Rugged point and isles at its north-west extreme, including the entrances of Paterson inlet and port William, with a full and clear view of Foveaux strait and its numerous islets and reefs. To the westward will be seen Solander island, and the whole stretch of coast line of the Middle island may be traced to Big river, a distance of 60 miles. Inland, as far as the eye can reach, there is an uninterrupted view of either a level or gently undulating country, bounded to the westward by a range of mountains, stretching from the sea near Jacobs river to the high mountain ranges of the great central ridge, and to the eastward by the hills stretching from Nugget point to the north-westward; due north the level country joins some lofty insulated ridges from 60 to 80 miles distant, and varying in elevation from 5,000 to 7,000 feet. This region is the southern portion of the great lake country of the interior whose waters are carried off by the Clutha, Mataura, New, Jacobs, and Waiau rivers.

BLUFF HARBOUR* (*Awarua*)—formerly a large whaling station—is at high water an extensive sheet of water stretching in two arms to the north and east, respectively 4 and 5 miles. The available space for anchorage, however, is narrow and confined, and, for vessels of large tonnage, not extending much above a mile from the entrance in a north-westerly direction. Above this, as well as the whole of the eastern portion, is flat and shallow, the greater part being uncovered at low-water. The tides run very strong, during the springs as much as 7 knots; there is also a heavy tide rippling at the entrance, caused by the meeting of the harbour tide with that in the strait. The entrance to this harbour (which is now much frequented by the mail steamers which connect at Melbourne with the Suez mail steamers) has been buoyed, as also has the harbour itself. Campbelltown stands at the foot of the Bluff, on the south side of the harbour, and is connected with Invercargill by rail over a distance of 20 miles.†

Signal stations.—On Bluff hill there is a signal station, with which vessels requiring pilots should communicate, or, when it is obscured, with the station on Starling point.

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* *See* Admiralty chart, Awarua or Bluff harbour, and New River, No. 2,540; scale, $m = 2{\cdot}0$ inches.

† Information on Bluff harbour is derived from New Zealand Government Notices, 1875, 1880, and 1882.

There is also a semaphore arm on the flagstaff on Starling point, which is only used should a vessel be seen standing into danger.*

At night a *red* light is shown on Starling point 20 feet above sea level.

Beacons.—On the north shore of Bluff harbour are two white beacons, the northern one having a small triangular top. The beacons in line, bearing N. by E., lead towards Starling point, off which the pilot boat should be seen.

There are also two white beacons (the western one having a small triangular top), and when in line, bearing W. by N., lead through North channel and close to the black buoy marking the north-east end of the shoal (Sandspit) on the south side of the channel.

Leading marks.—Two dolphins have been placed on the Middle spit, which lies north of the wharf on west side of entrance to Bluff harbour. One is situated on the extreme east end of the spit in 12 feet water, and is surmounted by a cross, painted red and white in horizontal bands. The other is on the middle of the spit, in 4 feet water, and surmounted by a Y-shaped beacon, painted red and white in diagonal bands. These dolphins, when kept in line bearing about N.W. by W. ¾ W., lead through the deepest part of the channel, between Te-waewae point and Burial point, in not less than 24 feet water.

Light-vessel.—A *fixed* white light is exhibited from a small vessel placed on the western side of the narrowest part of the entrance to Bluff harbour. The light-vessel, moored with four anchors (quarterly), swings in her own length, and lies with the following bearings and distances, viz.:—

Triangle rocks (sunken) S.S.E., distant three-fourths of a cable; and Burial point S. by E. 2 cables.

Note.—Care should be taken by vessels dropping past the light-ship, not to hook the moorings which extend 20 fathoms from her. Close to the light-vessel, there is a depth of 13 feet at low water spring tides. Vessels drawing over 12 feet, should not at low water, come southward of the line joining the light-vessel and the northern face of the jetty.

Buoy.—A red buoy marks the south-west end of the shoal on the east side of the south passage, and lies in 6 fathoms, with Starling point bearing N. by W. ½ W., and Lookout point W. by S.

Sandy knoll, lying about 3 cables E.N.E. of Starling point, and over which there was formerly a depth of 2 fathoms, is now reported (1881) to have over it a depth of 3½ fathoms.

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* *See* page 15 for the General Harbour signals.

The knoll situated nearly 4 cables S.E. ½ E. of Te-waewae point, and over which there was formerly a depth of 3 fathoms, has shoaled and extended about 1½ cables to the southward; there is only a depth of from 1¾ to 2 fathoms over it. A chequered black and white buoy has been placed on the north-west extreme of this shoal, and a red buoy on its south-east extremity; both of these buoys are in 3 fathoms water. When entering by the south channel these buoys must be left on the starboard hand, and entering by the north channel on the port hand.

DIRECTIONS.—Vessels coming from the eastward, in moderate weather, with an easterly wind between north and south, should enter through the North channel, by steering for the sandy point about 3 miles eastward of the harbour, until within half a mile of the shore, when the black buoy will be seen, which marks the north-east end of the sand-spit. This buoy is moored in 5 fathoms, with Dog island bearing S. by E. ½ E., and Bluff summit flagstaff W. by S. ¾ S.* The North channel is between this buoy and the shore. In moderate weather the pilot will board here, but should the pilot boat not be in sight, steer along the land with the leading beacons in line W. by N., leaving the buoys on the port hand, and passing a cable off Te-waewae rock (the eastern extremity of North head, which is about 10 feet above water and bold close to), thence steer across for a large rock on the beach of the western shore with a white patch on it, off which the pilot can board in any weather. Vessels drawing over 15 feet water should not take this passage at or near low water, nor when there is a heavy swell on.

Vessels from the eastward taking the passage between Dog island and the sands should give the island a berth of three-quarters of a mile, and steer about W. ½ S. for Lookout point until Starling point bears North, or the leading beacons are in line N. by E., then steer in to pass about 1½ cables off Starling point, leaving the red buoy on the starboard hand, and when abreast of it the pilot boat should be seen.

Vessels of 14 feet draught should haul up for Te-waewae point when abreast of Starling point, as the beacons in line, when to the northward of this point, lead into 2½ fathoms at low water.

With westerly winds vessels from the eastward are recommended to work to windward outside or south of Dog island till off Lookout point, then proceed with the directions already given.

The best time for a large steamer or a sailing vessel with a fair wind to enter, is at high water or first-quarter ebb; but sailing vessels during westerly winds should be at the heads at half-flood.

The Bluff or western shore must be kept on board within less than 2 cables by vessels coming from the westward, as an extensive bank with shoal water (its south-west end marked by a red buoy) lies off the entrance, leaving a passage of one-third of a mile only between its western end and the Bluff coast, with from 5 to 9 fathoms water.

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* Position of buoy.—Brett's New Zealand Pilot, 1880.

Anchorage for small vessels may be had in 5 fathoms abreast Starling's house, which is on the Bluff shore, close to the water, and at a short distance within Starling point. In westerly or northerly winds this is a safe and convenient anchorage, but with strong southerly winds a vessel should run higher up.

Large vessels intending to make any stay should anchor one mile above Starling point, within 1½ cables of the western shore, in 4 fathoms; after passing this point, a mid-channel course may be steered between the entrance points until the dolphins on the Middle spit are in line, which lead through the narrowest part of the channel leaving the Triangle rocks, a sunken patch more than a cable from the western shore, and the light-ship on the port hand. The line of shoal water on either side is marked by kelp, which, however, during the strength of the tide is run under. The upper anchorage is secure in all winds.

There is no steam tug at Bluff harbour, but the services of coasting steam-vessels can often be obtained at moderate rates.

Jetty light.—The wharf in the harbour, with a depth of 20 feet alongside at low water, is situated 3 cables westward of the light-vessel, from the end of which a *red* light is exhibited.

Tides.—It is high water, full and change, in Bluff harbour at 1h. 18m.; springs rise 8 feet, and neaps 6 feet. The stream, on both flood and ebb, runs one hour after high and low water by the shore.

DOG ISLAND lies 2½ miles S.E. by E. from the entrance of Bluff harbour; it is low, and three-quarters of a mile in extent; the sea breaks heavily for some distance off its northern and eastern sides.

Sunken rocks.—A sunken rock with 2 feet on it at low-water spring tides, is reported to lie a quarter of a mile from the west end of Dog island, with the lighthouse on the island bearing S.E. Another rock, which is awash at low-water spring tides, is also reported to lie a quarter of a mile from the east end of the island, with the lighthouse bearing W. by S.*

LIGHT.—A lighthouse is erected on Dog island, from which is exhibited a *revolving* white light, attaining its greatest brilliancy every *half-minute.* It is elevated 150 feet above the sea level, and in clear weather should be seen at a distance of 18 miles.

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* Breakers are reported as having been seen in several places from one to 3 miles north-eastward of Dog island. Until this locality has been examined, vessels should approach it with caution.

The tower is of gray stone, 118 feet high from base to vane.

From the scarcity of harbours on this part of the coast, and the position of this one with respect to the great plains which approach so near it, Bluff harbour will undoubtedly, when the tide of emigration sets in in this direction, become a port of considerable importance; although in consequence of its narrow entrance and great strength of the tides, the access to it must always be attended with a degree of risk to large sailing vessels. To steamers or small vessels, choosing the proper time for entering, which is high water or first-quarter ebb, no difficulties will present themselves. This harbour will also derive considerable advantage from the ports of Stewart island being so near, where vessels may lie in perfect security, and wait their opportunity to enter; port William is peculiarly eligible for this purpose, and in the event of the Bluff country becoming colonised, ships would probably make it their head quarters. Cargoes might be conveyed across, and communication easily kept up by small vessels; the distance is only 16 miles in a N.N.E. direction, and the prevailing winds favour the passage across both ways; with south-westerly, westerly, or even north-westerly winds when not too heavy, a vessel leaving port William at the last-quarter ebb, would be at the entrance of Bluff harbour by the first of the flood.

From the Bluff, the coast trends N.W. by W., in two rocky bights, to Steep head, distant 8 miles; the latter is a steep, black, cliffy headland, with a small rocky islet off its extreme, and forms the southern entrance point of New river.

NEW RIVER* (*Orete*) is accessible in moderate weather, at high water, for vessels drawing from 13 to 15 feet water; but from the exposed and shifting nature of the bar, and channel within, as also the rapid tides, it is essential that a stranger should employ a pilot, or be guided by the information obtained from the signal station. A semaphore arm on the mast is used. From its proximity to so large and fertile a district, New river will perhaps eventually rival Bluff harbour as a shipping port. It has afforded shelter to a whale ship in distress of 500 tons,—the *Bombay*.

The south or outer entrance point, is well marked by Steep head and Point islet; the northern point is low and sandy. A shifting bar, with 9 and 10 feet at low and 16 feet at high water ordinary springs,† runs across from Steep head to an extensive bank of sand, extending from the North point, which covers at half-tide; the bar is narrow, and within it the water soon deepens to 4 and 5 fathoms, till the Bombay rock—4 feet above high water—is reached, and to which the anchorless ship of that name was secured.

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* *See* Admiralty chart, Awarua or Bluff harbour, and New river, No. 2,540; scale, m = 2·0 inches.

† The Harbour-master, New river, observes that the depth on the bar at high water, ordinary spring tides, is 14 feet (October 1882).

Guiding Star rock, a sunken danger having a depth of 5 feet at low-water, lies S.W. ½ S. 2 cables from Bombay rock and nearly in mid-channel. Abreast of the danger is moored a white buoy, which by vessels entering should be left on the starboard hand. Should the buoy be adrift, the rock may be avoided by not bringing Bombay rock to bear northward of N.E.

Directions.—Vessels bound for New river should not approach to within one-third of a mile westward of Point island, as a sunken rock lies about 2 cables off it in that direction, then steer for a spiral-shaped black buoy outside the bar, moored in 6 fathoms, bearing from the west end of the island N. ½ W., distant half a mile. As the buoy is approached the leading white beacons will come on, bearing E. ¾ S., keep them in one, leaving the black buoy on the port hand, to cross the bar, its breadth is about a cable, and inside in 4 fathoms is a spiral-shaped white buoy marking the south side of the channel; keep between the white buoy on the starboard, and black on the north side, passing Guiding Star rock as previously directed.

Bombay rock, 1½ miles inside Steep head, is marked by an iron beacon with a barrel on top painted white; the width of the river here is from 3 to 4 cables. The general course in is E. ¼ N. gradually hauling up to N.E. as the rock is approached; passing north of it, anchorage may be had in 3 fathoms at low water, a long cable from the northern shore, with the low sand-hills of the north entrance point bearing W.N.W. New river was ascended by a whale boat from H.M. surveying vessel *Acheron* for a distance of 25 miles, through a low rich grazing country, wood scarce and in clumps.

Tides.— It is high water, full and change, in New river at 0h. 10m.; springs rise 8 feet, and neaps 4 feet.

Compared with Bluff harbour as a port for shipping, it has the advantage of access to the interior, while the tides are not nearly so strong; the Bluff, however, is a better port, and being without a bar, is accessible for vessels of any tonnage.

Invercargill.—On the plains of the Bluff, 8 miles within the entrance of New river, on the eastern margin of an extensive shoal estuary, the settlement of Invercargill was established in 1856; the district inland, having great pastoral capabilities, with a large extent of fine agricultural land on the seaboard, well wooded, is rapidly rising to importance. The population of the district (1878) was 3,761.

Two training walls have recently been erected at Invercargill, running parallel with the river channel, extending southward 2,508 feet from the jetty and northward 2,442 feet, marked by white beacons on the east and black on the west side. A gas light, 13 feet above high water, is exhibited from the end of the jetty, and visible from the commencement of the training banks.

COAST WESTWARD of NEW RIVER.—From New river the coast trends in a long sandy beach to the north-west, 15 miles, when it curves round to Howell point, and forms a shallow bay or bight just within it. In this bight at 1½ miles north-west of that point, is Riverton township at the entrance of Jacobs river, the bar of which is nearly dry at low water, but vessels of 7 or 8 feet draught enter at high water. "The entrance being intricate, a stranger should not, under any circumstances, attempt to sail in without a pilot, who—when it is practicable—will board vessels approaching the port. Should the weather prevent this, the Colonial bar signals will be used, and communication held by means of the Commercial code of signals with the signal staff on South head. The depth of water on the bar is, at the highest tides, 10 feet, and there is seldom less than 8 feet at high water with the lowest neap tides."*

The pilot and signal station is under the superintendence of the Harbour-master.

There is anchorage in Howell road, about one mile off the river's mouth, where vessels may wait for the tide to enter, but they should not lie there in southerly or easterly winds.

From Howell point the coast trends W. by S. ½ S. 10 miles to a projecting rocky point (*Wakaputa*). Midway between, at the western end of a sandy bay, is a native village, where a small mountain stream runs down, with a boat harbour at its mouth; this is remarkable as the last fixed native settlement on the coast. From Wakaputa, a rocky and indented coast trends W.N.W. 6 miles to Pahia point, the eastern extreme of Tewaewae bay.

Dangers.—The northern shore of Foveaux strait, from New river to Pahia point, a distance of 25 miles, is fronted with numerous detached reefs and rocks, extending in some cases as far as 8 miles from the coast. Centre island, which lies nearly at their outer or southern boundary, will be found a good guide for avoiding them.

CENTRE ISLAND is of triangular shape, moderately high, and about three-quarters of a mile in length; it lies 4 miles S.E. from Wakaputa point, and W. ¾ N. 22 miles from the Bluff, and has a sunken rock (the Hapuka), a little more than one mile S.W. of its centre. Midway between it and Wakaputa point are two extensive reefs awash, with a high rock on the east end of the southernmost one.

LIGHT.—A lighthouse, 20 feet high and painted white, stands on the southern extremity of Centre island, from which at an elevation of 265 feet above the sea is exhibited a *fixed* light. It shows white from seaward through an arc of 176°, or between the bearings of S. 82° E., through east and north, to N. 78° W.; *red* from N. 78° W., through west, to S. 4° E.; also *red* from S. 54° E. to S. 82° E.: between the bearings of S. 4° E. to S. 54° E., the light is obscured. The white light should be visible in clear weather from a distance of 22 miles. Its intersection with the *red* arcs leads only just southward of Escape reefs to the eastward, and Fish reef to the westward; vessels therefore in the vicinity of these dangers, should be careful to keep well within the white light.

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* New Zealand Nautical Guide, 1876

Fish reef, which lies 3 miles south-westward of Wakaputa point, and W. by N. 4½ miles of Centre island, is an extensive patch; it breaks, and has 26 fathoms close outside it.

Escape reefs, the most southerly of the many dangers on this coast, are 4 miles eastward of Centre island. They are two detached reefs lying W. by N. and E. by S. of each other and 1¾ miles apart; each has a solitary rock about 20 feet above the sea. The eastern reef is 4 miles E. by S. from Centre island; North 12 miles from the north point of Stewart island; S. by W. ¼ W. 7 miles from Howell point; and W. ¾ N. 17 miles from the Bluff. About one mile N.N.E. from each of the Escape reefs lie two other reefs awash.

Pig island, a low round island, lies 2¼ miles S.W. ¼ S. of Howell point, with a sunken rock half a mile south-eastward of it, and two reefs awash between it and the shore.

Half-way rocks are two rocks standing well out of water lying in a north-west and south-east direction, and nearly three-quarters of a mile apart; the south-easternmost bears N. W. by W. ½ W. 3¾ miles from Steep head, and is 3½ miles from the sandy beach to the northward. A mile inshore of them are two other rocks awash, between which and Half-way rocks is a depth of 7 fathoms water.

Doubtful rock.—This sunken rock, which only breaks in heavy weather, and whose exact position is doubtful, is placed on the chart bearing from Steep head of New river W. ¼ N. 7½ miles; from Howell point S. by E. ½ E. 5¼ miles; and from the southernmost of the Escape reefs N.E. by E. ¾ E. 4 miles, which cannot be far from its true position.

Caution.—There is deep water among and between many of the dangers just enumerated; they should be therefore approached with caution, and avoided in thick weather. Vessels are recommended not to pass within the 20-fathom line on this part of the coast, and to keep 3 miles to the southward of the Escape reefs and Centre island. The coast between Wakaputa and Pahia points should not be approached within 4 miles by passing vessels.

TEWAEWAE BAY, westward of Pahia point, is a remarkable square-shaped bay, 7 miles in depth; Sand-hill point, its western extreme, bears W. ¼ N. 15 miles from Pahia point, and was so named from the coast terminating in a ridge of low sand-hills projecting from the high mountain land 5 or 6 miles northward. There are several detached rocks and reefs extending one mile off it, and at the distance of 2 miles from the shore 16 and 18 fathoms will be found; 2½ miles northward of this point is **Mussel** beach of the whalers, a small cove with a deserted whaling station, off which there is good anchorage in 5 fathoms, with all westerly winds, even as far round as south-west, but a heavy swell sets in with the wind in a more southerly quarter.

Two rapid barred rivers in the north-west and north-east corners of Tewaewae bay carry to the sea the waters of a wild mountain region; the easternmost river (*Waiau*) apparently traverses a grassy district, and flows from a large lake in the interior; the natives, carried by a rapid current, descend on rafts during their excursions to the sea coast from the country at the back of the ranges near Milford haven. The westernmost of these rivers separates the open country from the remarkable mountainous district to the westward.

Mid-bay reef is a treacherous reef lying in a direct line between the points of Tewaewae bay, and 4½ miles from Sand-hill point, which in moderate weather only occasionally shows itself, and is surrounded by a depth of 12 fathoms; the soundings in the bay range from 15 to 5 fathoms, but in southerly and heavy south-west gales it breaks all over.

COAST from TEWAEWAE BAY to PUYSEGUR POINT.—From Sand-hill point the coast trends a little to the southward of West, 23 miles to Green islets, and has rather a low rocky outline, without remarkable features; the subsiding spurs from the back mountains almost reaching the coast. A constant surf breaks on this line of coast.

Six miles eastward of Green islets, Patupo, or Big river of the whalers, runs into the sea; its mouth is fronted with numerous rocks, inside which is a small place of refuge for sealing boats, known as Price's boat harbour; Green islets—a small cluster of that colour with some rocks—fronting the shore, point out the locality.

From Green islets the coast curves back, trending W. ¼ N. 6½ miles to Windsor point, and N.W. ¼ W. 3 miles to Puysegur point, on which stands a lighthouse (*see* p. 306), the south-west extreme of Middle island. One-third of a mile off this latter remarkable low sloping projection lies Marshals rock; it is large, flat-topped, and forms rather a conspicuous coast feature. Boats pass inside it in fine weather.

SOUTH OR STEWART ISLAND.

This portion of New Zealand, which was first seen by Captain Cook in 1770, and considered by him as part of the Middle island, was in 1808 discovered to be an island by the master of a merchant vessel, whose name by common consent it has since retained.

In connexion with the extensive pastoral country adjoining it on the Middle island, and which is so deficient in harbours, it bids fair to become of some importance, as it possesses, on its eastern and south-east sides, several excellent ports, affording every facility for shipping. At a former period, even before the labours of the missionaries had commenced in the North island, Stewart island and the adjacent coasts and islets had become the head-quarters of numerous European sealing and whaling shore parties, who acquired much influence over the native population, and many of these people, with numerous half-caste descendants, still reside there, forming in themselves an exceedingly interesting community; indeed they were (1851) by far the most numerous occupants of the soil.

The island is of an irregular triangular shape: its western or longest side runs in a north and south direction 39 miles, its north-east and south-east sides are respectively about 33 and 30 miles in length, and its greatest breadth is little more than 20 miles; it is for the most part mountainous and thickly wooded with timber adapted to shipbuilding and other purposes. An irregular ridge of mountains, of which mount Anglem, 3,200 feet above the sea, is the highest, runs in an east and west direction along the north coast of the island; almost in the centre, between the head of Paterson inlet on the east side and Mason bay on the west, rises a remarkable dome-shaped mountain (*Rakeahua*), of 2,110 feet elevation, and which in clear weather may be seen from nearly all points. The south end of the island is also extremely hilly, though the land does not attain such an elevation as in the north. Finger and Lees, bare granitic peaks, rising from the flat land north of port Pegasus, are very remarkable. The coasts are studded in many parts with numerous islets and rocks, worn and crumbling from the boisterous sea which is incessantly breaking upon them.

Commencing a description of Stewart island from its north-eastern extreme, Saddle point, the coasts and harbours of its eastern and southern sides will be the first described, and afterwards those on its western shores.

SADDLE POINT, remarkable in feature and position, is a rather low projecting point, the end of a spur from mount Anglem, lying 3 miles south-west of it. From the Bluff, on the opposite shore, it bears S.W. ½ W. 15 miles, and forms the breaking point of the westerly swell in Foveaux strait; after rounding this point, however hard it may be blowing from the westward, shelter, with comparative smooth water, is immediately met with. From Saddle point the coast trends S.E. ½ E. 8½ miles to the entrance of port William; midway between, at the northern end of a sandy bay, is a small stream known as Murray river.

Murray river, off which is a good roadstead in all winds westward of north-west; the anchorage is little more than half a mile off the shore in 9 fathoms. The river itself is a mere stream; its entrance, however, forms a good boat harbour, and on the banks is the principal half-caste settlement in the island; a clean sandy beach 1½ miles in extent, with a small portion of level land within, extends south-eastward of the river. The best anchorage is off the northern end of the beach, as it is in a measure protected from any north-west swell by a projecting rocky head: a vessel, however, should run for port William, if the wind veers to north-west and blows hard,—as it almost invariably will from that quarter,—although, as it has been before observed, a strong north-west wind in the strait is frequently to the southward of west on the Stewart island shore.

In moderate weather anchorage may be had, if necessary, along the whole line of coast between Saddle point and port William, one mile from the shore.

Gull rock is a white rock close to the shore, 3½ miles north-west of the west head of port William, and forms in appearance the south-east head of Murray river sandy bay.

Newton rock is a dangerous sunken rock lying E. ¼ N. 1$\frac{1}{10}$ miles from Gull rock, and N.W. ½ W. 2$\frac{3}{10}$ miles from the west head of port William. It is a long mile from the nearest land, has 6 feet on it at low water, and is not marked by either break or tide ripple; it is therefore an unusual feature in the navigation of these coasts, and, lying directly in the track of vessels running between Saddle point and port William, must be carefully avoided. There is a passage of 10 fathoms between it and the shore, and the same depth close around; small vessels generally pass inside. Leaving port William, a N.W. ¼ N. course will pass more than half a mile outside it, and when Gull rock bears W.S.W. a vessel may haul up for Saddle point.

Four-fathom rock.—A 4-fathom rocky patch lies E. by S. ¾ S. 1$\frac{7}{10}$ miles from Newton rock, and N. by W. ½ W. 1¼ miles from the south-east extreme of the west head of port William.

PORT WILLIAM* is an excellent little port, and although apparently open for a large vessel to anchor in, it is sheltered from easterly winds by the coast about Bluff harbour, Ruapuke island and the groups of islands and rocks between it and Paterson inlet; it is likewise so effectually protected from the swell that rolls round both ends of the island, caused by the constant westerly and southerly winds, that it becomes a perfectly secure haven. The port may be known by the bearing of the

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* Admiralty plan, Paterson inlet and port William, No. 2,541; scale, m=2·0 inches.

Bluff, which is N. by. E. ¾ E. 16 miles from its West head; its entrance bears also S.W. by W. 6 miles from the most northern of the group of islands immediately off it. Approaching from the northward, a remarkable white sand-patch will be observed 3 miles westward of the entrance, or just southward of Gull rock.

The position of port William, with regard to Bluff harbour and adjacent country must always render it a port of value. The schooners engaged in whaling and sealing make it their head-quarters, and hauling into the northern head of the port are perfectly land-locked; large vessels lie further out, with the Bluff just shut in with the west entrance point.

Pender rock, which is the only danger in entering port William, is a 10-feet rock, lying 3 cables E.S.E. from the West head, well marked by a long kelp patch, which also serves to break the swell with easterly winds.

Wood and water may be had in abundance from a bay and river at the southern head of the port, where there is also a native village; refreshments may likewise be obtained, though only in small quantities.*

Between 2 and 3 miles from the coast off port William to Paterson inlet, lie the groups of islands and rocks before mentioned; there is a good ship channel (Abbot passage) of 20 fathoms, one mile wide, between Bench island—the southernmost—and the groups northward of it. The smaller islands are barren craggy rocks, with strong tides and heavy ripplings among them, and it is therefore nct advisable in working through to stand very close to them.

Fish rock is a little more than one mile eastward of the East head of port William, nearly midway between it and the group of islands which lie off; it is 30 feet high, with deep water close to, and tide ripplings generally round it.

Horse-shoe and Half-moon bays are two small bays immediately southward of port William; they are much frequented by whalers, and afford good anchorage with off-shore winds in 5 and 6 fathoms. Half-moon bay, the southernmost, has a rock above water nearly in the centre, with a 9-feet patch a short distance within it; there are a few settlers on its shore. N.E. by E., nearly 3 cables from the southern point of Half-moon bay (Akers point), is Barclay rock, awash at low water; there is a passage for small vessels between it and the shore.

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* Remarks by Nav. Lieut. of H.M.S. *Dido*, 1872.—Port William abounds with fish. One settler only is living there now with his family, principally engaged in oyster dredging, finding a market for them at the Bluff. It is reported that the Otago provincial government intend colonising Stewart island shortly, port William being the point of disembarkation.

PATERSON INLET. —The entrance to this spacious port lies 4 miles south-eastward of port William, between Akers and Anglem points, which lie nearly north-west and south-east 2 miles from each other. This inlet is a deep indentation, running in a westerly direction into the centre of the island for a distance of 10 miles, and with a width in some parts of more than a league, being bounded on its northern and southern sides by high irregular land, and a flat valley running through the island from its head, the westerly gales rush down it with great fury, and ships should seek shelter in one of its numerous coves rather than anchor in its open waters.

Native island, one mile southward of Akers point, is almost connected with the mainland by reefs; it extends to the south-east for three-quarters of a mile, and narrows the entrance of the inlet to about the same width. Anglem point is the north extreme of a remarkable peninsula, 3 miles in length, which affords protection to the inlet from easterly winds; this peninsula is almost divided in three places by narrow necks of land; the middle, known as the Old neck, is merely a low sandy beach.

Directions.—Vessels entering Paterson inlet from the northward should pass inside the group of islands off port William, and on either side of Fish rock. Approaching from the southward, they may either take the Carter passage between Anglem point and Bench island,—the southernmost of the group, which has two remarkable rocks, the Twins, standing off its south-east extreme—or Abbot passage, between Bench island and Fancy group; if the former be taken, Passage islet, with a reef extending 1½ cables off its eastern end, will be seen in mid-channel; there is a deep water channel, half a mile in width, on either side of this islet. Between Bench island and Fancy group, there is a clear channel one mile wide, with a depth of 20 to 24 fathoms.

A reef of rocks awash extends north-west from Anglem point nearly one-third of a mile, and has generally tide ripplings off it; from 9 to 13 fathoms will be found in the entrance of the inlet, between it and Native island; and on the southern side some rocks, which are either awash or marked by kelp, extend for nearly a quarter of a mile off the northern coast of the peninsula.

Cooper island lies almost in the centre of Paterson inlet, one mile inside the narrowest part of the entrance; it is 2 miles long in an east and west direction, and above half a mile in width. Two small islets are off its south-west end, with two detached rocks awash at low water, lying a short distance to the westward of them; there are also some shoal patches a cable off the north-west end of the island, but they are marked by kelp.

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* *See* Admiralty plan, Paterson inlet and port William, No. 2,541; scale, $m = 2\cdot0$ inches.

Sydney cove, a sandy bight, about the centre of the north side of Cooper island, affords convenient anchorage in 9 fathoms for vessels making a short stay, but would not be desirable in easterly weather, when they should seek shelter on the western side of the peninsula off Old neck, in 10 to 12 fathoms, or in Glory cove.

Glory cove,* which is the most snug and convenient anchorage in Paterson inlet, lies on the south-west side of the peninsula, 2 miles southward of the east end of Cooper island; its entrance is 4 cables wide, and the general depth within from 4 to 6 fathoms with good holding ground. This is an excellent place for a ship requiring refit or repairs, and there is a point on the western side where, if necessary, vessels may be hove down with great facility, there being 18 feet at low water close to the beach. Vessels intending to anchor off Old neck or in Glory cove may pass between the east end of Cooper island and the peninsula, avoiding a shoal patch marked by kelp which lies off the peninsula side; this passage is a quarter of a mile wide, with a depth of from 16 to 20 fathoms.

South-west bay, immediately westward of Glory cove, is an extensive sheet of water running in a south-westerly direction 3 miles, with an average width of one mile; the general depth is from 12 to 14 fathoms, but anchorage may be had in 6 fathoms within one mile from its extreme; five islands lie off its western point, which narrow the entrance to half a mile.

For 2 miles above Cooper island, the main branch of Paterson inlet maintains a width of nearly 3 miles, with a depth of from 12 to 16 fathoms water; in working up, the shores should not be approached within a quarter of a mile, as several islets and rocky patches extend nearly that distance off; they are all, however, marked by kelp.

Kaipipi bay lies on the north side of the inlet, 4 miles above Native island; it is one-third of a mile in width, and has anchorage in 5 fathoms. Half a mile within, it shoals to 4 fathoms, and shortly afterwards to 10 feet.

Westward of Kaipipi bay, the inlet narrows to one mile, and the soundings decrease to 12 and 10 fathoms. At the distance of 2 miles above there is an extensive bay on the north shore, which at low water dries within the line of its entrance points; the main arm bending to the south-west, runs in that direction for 2½ miles farther, with a width of half a mile, and carrying a depth of from 10 to 6 fathoms, when it terminates in a shoal creek, which dries 1½ miles from its head, leaving a narrow boat channel of 2 to 3 feet at low water.

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* *See* Admiralty plan, Paterson inlet and port William, No. 2,541; scale, $m = 2 \cdot 0$ inches.

PORT ADVENTURE is 9 miles to the southward of Paterson inlet, the coast line between being a succession of bold rocky headlands, with occasional sandy beaches, but without shelter even for boats.*

East head, a projecting headland, and the eastern point of Stewart island, is 2½ miles northward of port Adventure. Two miles from this part of the coast the soundings range from 20 to 25 fathoms, sandy bottom, shoaling gradually as the shore is approached.

The port is small, and open to the eastward, but affords good shelter in all westerly winds; Entrance island renders the passage narrow for large vessels to work through. Stirling head, the northern entrance point, is steep and cliffy, with a small islet (*Weka*) lying close off it; the southern entrance point is formed by a peninsula, the east extreme of which, Shelter point, has a detached rock awash, lying nearly a quarter of a mile distant.

The best passage is between Stirling head and Entrance island; it is scarcely 4 cables wide, but has from 14 to 20 fathoms, except a patch of 18 feet which lies W. by S. ½ S. nearly 2 cables from the north point of the island. The passage southward of Entrance island is the same width, but has a rock in the centre of it, with 20 feet, marked by kelp; there is deep water on either side of this rock. Inside the heads there is a clear working width of three-quarters of a mile, with 9 to 13 fathoms; on the south side are several rocky patches, with no more than 9 feet on them; they extend a quarter of a mile from the shore, are marked by kelp, and have deep water between them. At 1½ miles within the entrance, the harbour terminates in three coves, in the southernmost of which, Oyster cove, small vessels might lie in safety with all winds.

Weka and Wreck reefs, lying off the entrance of port Adventure, are the principal dangers on this part of the coast. Weka reef, the northernmost, is a quarter of a mile in extent, detached, and although covered, always breaks; it bears from Weka islet N.E. by E. ¾ E., distant 1¼ miles, and from the north end of Entrance island N.E. ½ N. nearly 1½ miles. Wreck reef, so called from a small vessel having been lost on it, is also detached, and has a rock on it just above water; in bad weather it breaks very heavily. The position of this reef is E. by S. 2 miles from the east end of Entrance island, and N.E. ½ N. 3 miles from the outer Breaksea islet; from 29 to 33 fathoms will be found from one to 1½ miles outside them, and 10 fathoms within half a mile of the south end of Wreck reef.

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* *See* Admiralty plan, ports Pegasus and Adventure and Lords river, No. 2,542; scale, $\begin{cases} m = 2\cdot0 \text{ inches.} \\ m = 4\cdot0 \quad ,, \end{cases}$

On the neck of the peninsula which forms the southern side of port Adventure is a native village, the southernmost inhabited spot in New Zealand.

Breaksea islands.—From Shelter point the coast turns sharply to S.W. ½ W., and presents a most rugged outline; a group of barren and craggy islands extend 1½ miles southward from the point, the sea constantly breaking over and between them with great violence. From their proximity to port Adventure, and forming a barrier to the enormous swell which rolls along the south side of the island, they were named the Breaksea islands.

BRUCE REEF.—This serious danger, off the south-east extreme of Stewart island, was discovered in the ship *Bruce*, Thomas Meiklejohn, commander, in her passage from Otago (by the south of New Zealand) to Calcutta, and first publicly brought to notice in 1861. It is described as two low rocks from 3 to 6 feet high, and close together, on which the sea breaks heavily, and lies in the direct track of vessels closely rounding Stewart island in proceeding to or from the southern ports of New Zealand.

Its position, which appears to have been determined with some accuracy, is as follows :—

7⅒ miles	.. E. by N. ¾ N.	.. from Owen island off Lords river.
5⅒ „	.. E. by N. ¼ N.	.. „ the extreme of the Breaksea isles.
3¼ „	.. E. by S. ¾ S.	.. „ Wreck reef off port Adventure.
7¼ „	.. S.E. ¾ E.	.. „ East head, north of port Adventure.

Soundings, though tried for, were not obtained in its neighbourhood from the rapid rate of sailing of the ship in passing the danger. The mariner is therefore warned to keep a vigilant look out.*

LORDS RIVER† is 3½ miles south-westward of Shelter point, and may be known by a cluster of rocky islands lying off its eastern head, the coast between which and the Breaksea islands forms as a bight. This little harbour is a narrow arm of the sea running in a W. by N. direction, and is a snug anchorage for a steamer or small sailing vessel; H.M.S. *Acheron* took refuge in it during a westerly gale with a heavy sea running outside, but it cannot be recommended for a large sailing vessel, as the entrance is only 2 cables wide, and it is necessary to haul sharp round westward to secure a good berth, which is a quarter of a mile inside the western head in 6 fathoms, sand and gravel; here a vessel may lie perfectly land-locked. Nearly 2 cables above this anchorage are two shoal patches marked by kelp, and 4 fathoms water may be carried one mile above the heads; boat navigation extends 4 miles, when the river dwindles into a rapid mountain stream, running over a granite bed.

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* Bruce reef is not known to local men who have frequently visited the ground nor to the Maories living near, but it is reported that after heavy southerly gales, breakers have occasionally been seen in the locality.

† *See* Admiralty plan, ports Pegasus and Adventure and Lords river, No. 2,542; scale, $m = \left\{\begin{array}{l} 4\cdot0 \text{ inches.} \\ 2\cdot0 \text{ „} \end{array}\right.$

PORT PEGASUS* may be recognised by Fraser peaks, three remarkable bare granite cones from 1,000 to 1,430 feet high, over the south arm, about one mile from the west side of Stewart island. The main entrance of this noble port is 18 miles S.W. by W. from Lords river; the coast between has an irregular rocky outline, with numerous scattered rocks fronting the shore. Black rock, the most remarkable, is 20 feet high, and not larger than a small vessel; it lies 1¼ miles from the nearest shore, and is 10 miles from the main entrance of port Pegasus. White rock, three-quarters of a mile from the coast, is 2 miles westward of Lords river. Totoes bay, a small sandy cove with a boat harbour at the head of it, is 6 miles westward of that river, and has a small islet standing off its eastern cliffy head. At a distance varying from one to 3 miles from this coast, there are from 35 to 47 fathoms water over a sandy bottom.

Entrance channels.—The port is 7 miles in extent north-east and south-west, lying parallel with the coast, which gives it a broken appearance, from the many passages in: three islands lie in the entrance, which form the same number of ship channels between them. The main or Broad passage, half a mile wide in its narrowest part, lies between Pearl and Anchorage islands—the north-east and centre islands—and carries a depth of from 20 to 24 fathoms, with no dangers. The southern or Narrow passage is between Noble island—the south-westernmost—and the mainland, and in its narrowest part is not more than 1¼ cables wide, with a depth of 15 fathoms. The northern or Whale passage is still narrower, being only a cable across, with a depth of 5 fathoms—it lies between the northern shore and Pearl island; between Noble and Anchorage islands, there is only a boat passage.

Either of the three ship channels may be taken according to circumstances, though Broad passage alone is recommended for a vessel of large size to work through; it trends N.W. by N., and the Narrow and Whale passages W.N.W.

The port is divided into two distinct portions, the north and south arms, which are connected by a narrow strait, named Acheron anchorage; Broad and Whale passages lead direct to the north arm, and Narrow passage to the south. In the north arm the general depth of water is inconvenient for anchoring, being from 20 to 25 fathoms, but anchorage in 12 fathoms may be had just to the westward of a small island which lies at the north head of the arm, 2 miles from the entrance. In the south arm the depth is more moderate, and anchorage may be had in from 12 to 14 fathoms half a mile within Narrow passage, between Micrometer rock and Noble island; there are also several coves, within the entrances of which vessels may anchor in from 8 to 10 fathoms. Shipbuilders cove, on the north shore, has some rocks and shoal patches in it, which, however, are marked by kelp. Besides Micrometer rock, which is a small rock above water, in the centre of this arm, with a reef extending nearly a cable to the northward of it, there are also several small islets scattered about, but no dangers not marked with kelp.

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* *See* Admiralty plan, ports Pegasus and Adventure and Lords river, No. 2,542; scale, $m = \begin{cases} 4\cdot0 \text{ inches.} \\ 2\cdot0 \text{ ,,} \end{cases}$

Acheron anchorage is a narrow strait, about 2 cables wide and 1¼ miles long, connecting the north and south arms of port Pegasus, it is formed by the mainland on the north, and by Noble and Anchorage islands on the south, and affords the most convenient and sheltered anchorage in the port, in 9 and 11 fathoms, mud bottom. Three small islets, however, which lie in the eastern entrance, narrow it so much as to render it only fit for a steamer or small sailing vessel from that direction; this entrance, Steamer pass, is south of the islets, and has a depth of 10 to 15 fathoms. This anchorage therefore is not generally available for ships entering by Broad passage, but those entering the port by the Narrow or south-west passage with a leading wind, and intending to make any stay, should take advantage of it: the western entrance is clear, and 2 cables across, and if preferred ships may anchor in the broad part of the entrance in 11 fathoms, well sheltered.

Seal creek, a deep and narrow inlet, penetrates the shore in a northerly and then in a westerly direction from the western entrance of Acheron anchorage.

Water, etc.—Port Pegasus abounds in excellent timber fit for shipbuilding or other purposes, and no difficulty will be found in procuring fresh water from the streams in any of the coves. Wild fowl are numerous in some parts.

WILSON BAY is a deep indentation trending north and south, 4 miles south-westward from port Pegasus and 2 miles north-east of Cook's South cape; its shores are skirted with rocks, and being exposed with a depth of 14 to 20 fathoms, it can only be considered a retreat in case of necessity; small vessels may, however, obtain shelter in Burial cove, on its western side, half a mile from the head of the bay.

The southern end of Stewart island terminates in a block of land 4 miles wide, the extreme of which, the South-west cape, called by the natives the tail of the island, is 3 miles westward of Cook's South cape, and has sunken rocks extending nearly half a mile off it; the neighbouring land is high and bold, with a steep and rugged shore.

THE TRAPS are two dangerous and well-named reefs lying to the south-eastward of the south end of Stewart island. The north Trap reef covers a space of 2¼ miles, and has two rocks near either extremity, 3 to 5 feet high, resembling in shape a boat turned bottom up: the centre of the reef bears from Cook's South cape, E. ¼ S. 15 miles, and is distant 11 miles from the nearest land (between Wilson bay and port Pegasus), the depth between being 60 fathoms. Two miles south-westward of this reef, there is a depth of 23 fathoms.

The south Trap reef does not cover so much ground as the north reef; it is nearly 2 miles in extent, with portions from 4 to 6 feet above high water, and heavy breakers about it; its centre bears from Cook's South cape S.E. by E., distant 20 miles. These two reefs bear from each other N. ¼ W. and S. ¼ E., distant about 9 miles, with 48 fathoms water between them.*

SOUTH-WEST COAST.—The south-western side of Stewart island is fronted by an irregular group of rocky islands; the most outlying of these, Wedge island, is one mile long, and fully 6 miles from the land. These islands are all similar in feature, their western faces being steep precipitous cliffs, from 300 to 400 feet high, sloping to their eastern sides, where boat harbours are generally found; the natives frequent them during summer for mutton birds.

There are clear passages among these islands; between the largest, Long island, and the mainland, there is a channel 1¼ miles wide; the tides, however, run with great velocity, and render the passages hazardous to attempt. The northernmost of this group, Moggy isle, lies 4¼ miles N.N.E. from Wedge island, and is about the same size.

PORT EASY, a confined anchorage in 5 fathoms for small vessels, is occasionally frequented by sealing craft, and lies 9 miles to the northward of South-west cape; its entrance, north and south, is about a quarter of a mile in width. Two small islets, the Brothers, lie 2 miles westward of its entrance, and the same distance north of it a rocky cluster of four islands (Boat group) extend from the coast 3 miles to the south-west, and serve in some measure to break the sea.

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* The ordinary north-east sea breezes of the east coast appear to be lost about the south Trap reef, being met by the N.N.W. wind of the west coast; for this reason vessels bound either way should give the Traps a wide berth.—Remarks of Commander B. Drury, H.M.S. *Pandora*.

A shoal called the Boomerang breaker is reported (1862) as lying about N.W. by N. 3¼ miles from the south Trap. It is also reported that during bad weather breakers have been seen eastward of the Traps, and as the tides are strong in their vicinity, passing vessels should give them a wide berth.

Between port Easy and Mason bay, a distance of 15 miles, there is no shelter for vessels; the coast presents an irregular outline of high rugged cliffs, on which a heavy westerly sea or swell is constantly breaking. A deep indentation runs in south-east, 3 miles southward of Mason bay, where boats may obtain shelter by hauling up inside the rocky ledges at the extreme head.

MASON BAY is a peculiar low sandy feature on this wild and inhospitable west coast; it has a sandy beach 5 miles long, with wooded flats at the base of the mountain ranges, running down from the dome-shaped peak in the centre of the island. There is anchorage in its southern part in 3 to 4 fathoms, protected from west and north-west winds by the Ernest isles, two jutting red cliffy-faced islands. A heavy sea rolls into the bay from the northward, but small vessels can lay here well sheltered, and in case of emergency a large vessel by getting sufficiently close to the Ernest isles, will be in a secure anchorage. These islands lie close together, with a boat passage between; the south island is connected with the mainland at low water by a sandy neck.

Dangers.—Guide rock, above water, lies half a mile W. by S. from the north end of the northern Ernest island, and also a rock nearly awash 2 cables westward of its south-west end. Look-out-for reef, a dangerous patch, more than half a mile in extent, also nearly awash, lies N.W. by N. 2½ miles from the northern extreme ot the same island, with a clear deep-water channel between. On a N.N.W. ½ W. bearing, and little more than 3 miles from this reef, is another shoal, which only breaks occasionally; between them there is a depth of 25 fathoms.

CODFISH ISLAND lies 9 miles N.N.W. ½ W. of Ernest islands, and 4½ miles S.S.W. from the Rugged isles, which extend off the north-west extreme of Stewart island. It is 3 miles long in a north-west and south-east direction, and 2 miles across, moderately high, level-topped, with a small stony eminence rising near its centre; between it and Stewart island is a passage nearly 2 miles wide, with a depth of 7 and 8 fathoms; High rock lies in the centre of it.

Sealers bay is a confined anchorage on its north-east side, well sheltered from all westerly winds, in 6 to 8 fathoms; this was formerly the head quarters of the sealers, but is now deserted. The western side of the island is composed of high rugged cliffs, with rocks and foul ground extending one mile off shore; at the distance of 2 miles there is from 30 to 36 fathoms, sand and gravel bottom.

On the coast of Stewart island, fronting Sealers bay, is a castellated peak, strikingly bold and remarkable from its peculiar rocky formation. The coast southward of this peak, as far as the north end of Mason bay a distance of 8 miles, is thickly strewed with rocks, extending one mile off shore, on which there is at all times a heavy swell and occasionally blind breakers on the foul ground a league off the land. This treacherous space has been the cause of much loss of life to the early sealers in passing it in their boats.

RUGGED ISLES (Raggedy point of the sealers), extending 1½ miles from the north-west point of Stewart island, is a remarkable cluster of high black craggy rocks, worn by a turbulent sea into the most jagged and fantastic shapes. Boats seldom venture inside them, and heavy tide ripplings extend some distance to seaward; a depth of 24 to 30 fathoms was carried on rounding them at the distance of from half to one mile, but sailing vessels should not approach within a league of this part of the coast.

CAVE POINT is E.N.E. 3½ miles from Rugged islands extreme.

White rocks lie 1½ miles N.N.E. from this point; they are a detached cluster 20 feet high, with a sunken rock outside them to the north-west. A league eastward of them is Black rock point, the north extreme of Stewart island, and just westward of it is a remarkable white sand patch; thence the coast trends E. by S. 5 miles to Saddle point. This northern portion of the coast is principally a rugged rocky outline with occasional shingle beaches; mount Anglem and the lofty ridge westward of it send down their steep spurs to the sea shore.

TIDES.—The flood tide coming from the southward strikes the south end of Stewart island and divides, one part running northward along its western side, and then to the eastward through Foveaux strait; the other runs north-east along the south-east side of the island, as far as port Adventure, where they meet again and flow eastward. The ebb takes exactly a contrary direction, splitting near port Adventure; it runs north-west through the strait, and down the west side of the island, and south-west along the south-east side as far as South-west cape.

It is high water, full and change, at ports Pegasus and Adventure at 11h. 50m. and 0h. 20m. respectively; at port William and Paterson inlet at 0h. 45m. and 1h. 10m.; and Mason bay at 11h. 10m.: springs rise 8 feet, and neaps 6 feet. The strength of the tides off the coast is from half to 1½ knots, except in the narrow passages; thus, inside the group of islands off port William and Paterson inlet it runs from one to 3 knots, and in the passage between South-west cape and Long island, as much as 4 knots during springs.

THE SNARES

Are a bold and moderately high group of islands covered by myriads of the pintado or cape pigeon, and other sea birds; they lie 62 miles S.S.W. of the south-west end of Stewart island, and extend 4½ miles in a N.E. by E. and S.W. by W. direction; they are an excellent landmark from the westward, and are recommended to be made as a point of departure in passing south of Stewart island, whereas the name they bear would deter vessels from approaching them.*

The north-east or largest island is little more than one mile in length by half a mile in breadth, rising on the south side perpendicularly to the height of 470 feet; the north-east side is less precipitous, and probably accessible under very favourable circumstances; the western portion of the group consists of four islets, separated from the large island by a channel 2 miles in width. In 1790, H.M.S. *Chatham*, Lieutenant Broughton, ran through this channel, passing a breaking reef of rocks lying in nearly a direct line between the larger island and the western group, narrowing the channel between the reef and the former to about 1¼ miles.

A depth of 79 fathoms, coral, was found by H.M.S. *Pandora* 2 miles north and south-east of the large island, deepening seaward in every direction, except in a line towards the Traps rocks, where it gradually decreases to 40 fathoms one mile from the south reef of the latter.

The south-west island is in latitude 48° 6′ 43″ S., longitude 166° 28′ 40″ E.; the tides about the group are inconsiderable.

NORTH-EAST ISLAND.†—The coast generally of the north-east and largest of these islands is formed of precipitous cliffs, nearly perpendicular, except on the north-east side, where the land rises gradually from the sea. The island is composed of rough coarse granite, covered with a chocolate-coloured vegetable mould of variable thickness, in which are numerous bird burrows, every available piece of soil being made use of by them.

Vegetation.—This island is tolerably well covered with vegetation, consisting chiefly of a heavy scrub, varying in height from 10 to 15 feet, and coarse, high, broad-bladed grass, growing in tufts, together with a finer wiry kind of grass, on stems 2 to 3 feet high.

Boat harbour.—About the centre of the north-east side of this island there is a good boat harbour, the shores of which are rocky; the entrance is about 30 yards wide, with a depth of 9 fathoms in the centre, decreasing gradually to 3 fathoms near the head of the boat harbour, on the north side of which is the landing-place.

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* *See* plan on Admiralty chart, Foveaux strait and Stewart island, sheet XI., No. 2,553.

† Information relating to the Snares derived from a report made to the Marine Department, New Zealand, by Captain R. Johnson and Mr. J. Blackett, Marine Engineer, on visiting these off-lying dangers in the Government steam-vessel *Luna*, 1875.

This boat harbour is open to the north-east, but safe in all weather for boats. About 75 yards in a north-easterly direction from the entrance lies a sunken rock.

Temporary anchorage.—The Snares are surrounded with deep water, and there is no anchorage except close under, and to the eastward of North-east island, where a steam-vessel may ride with a stream anchor in 40 fathoms during moderate weather.

Water.—Fresh water is plentiful on North-east island, but strongly impregnated with peat and guano.

Eastward of North-east island lies a smaller island of much the same character; there is a boat passage between them.

Western islets.—The largest of the four western islets is about a quarter of a mile long, and the smallest about half that size.

These islets lie in a north and south direction, and extend over a mile, forming a rugged ridge of almost inaccessible rocks, the highest of which are 290 feet high.

No vegetation or water appears on any of the western islets, and landing can only be effected in the finest weather.

CHAPTER IX.

WEST COAST OF THE MIDDLE ISLAND, FROM THE WESTERN ENTRANCE OF FOVEAUX STRAIT TO CAPE FAREWELL.

VARIATION IN 1883.

Preservation inlet	15° 55′ E.	Arnott point	15° 30′ E.
Cape Foulwind	15° 00′ E.		

The only places of shelter for shipping along the whole extent of the west coast of the Middle island,—a distance of 500 miles,—are those singular and truly remarkable sounds or inlets which penetrate its south-western shores between the parallels of 44° and 46° south latitude.*

The precipitous and iron-bound coast line which forms the sea wall, as it were, in which these inlets may be almost likened to so many branches, runs in a N.N.E. and S.S.W. direction; and the thirteen sounds are included within a space of little more than 100 miles.

With the exception of Cook's excellent description of Dusky bay, (explored during his second voyage in 1773,) nothing has been recorded of this remarkable region; nor, until an examination by H.M.S. *Acheron* in 1851, was it known to any but a few adventurous whalers, whom stress of weather alone had compelled to seek shelter on its desolate and inhospitable shores. The character and feature of these sounds so much resemble each other, that it seems desirable to offer a description of them generally before entering into a detailed account of their capabilities individually.

Approaching from seaward there is so much sameness in the appearance of the land, that unless a vessel knows her position accurately, it is not easy at a distance to distinguish the entrance of one sound from another, and the smaller inlets at a distance of 4 or 5 miles have more the appearance of ravines between the high and rugged mountains than the entrances of harbours; in moderately clear weather the coast can be made with confidence, and as the entrances are generally equi-distant from each other (about 8 miles), and all running in an easterly direction, there would be little danger to be apprehended from a lee shore; it must be remarked, however, that a fresh or even strong westerly wind in the offing frequently dies away within a mile of the coast, leaving a vessel at the mercy of a calm and swell, when recourse must be had to towing, which probably, in any vessel but a whale ship, would be impracticable ; moreover, in consequence of the enormous quantity of fresh water which falls in cascades from the steep mountain ridges, there is always an outset, particularly from the smaller sounds, and frequently a draught of wind down their narrow arms, so that unless with a fresh fair gale, which blows right home and up the sounds, sailing vessels will generally find it a difficult and tedious operation to fetch inside their entrances.

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* *See* Admiralty coast chart, Foveaux strait to Awarua river, sheet XII., No. 2,589; scale, m = 0·25 inch.

The larger of the sounds are in some measure exempt from these inconveniences; they are generally divided into several arms, penetrating the coast, in some instances for a distance of 20 miles, with a breadth rarely exceeding one mile, and studded with numerous islets. The smaller sounds generally run in for a distance of from 6 to 8 miles, with a width of about half a mile, and anchorage is seldom to be found except at their inner extremes.

The shores, which rise almost perpendicularly from the water's edge, are in the immediate neighbourhood of the sounds covered with trees suitable for all purposes; among them the red pine, which, although heavier and inferior to the kauri, is well adapted for masts, and a vessel requiring spars could procure them of any size, up to a sloop of war's lower mast, with little difficulty; for this purpose the southern inlets are preferable.

The most remarkable feature, common to the whole, is their great depth of water. Soundings can rarely be obtained under 80 or 100 fathoms, and frequently at much greater depths; and the shores, within a few yards, are quite steep-to. Vessels may frequently with advantage warp up by laying out lines to the shore; and when a cove is reached where an anchor may be dropped, it will generally be necessary to secure to the trees also, to prevent being drifted off the steep bank by a flaw of wind. These flaws or squalls frequently blow with great violence off the high land, or down the gullies, during heavy gales outside.

At the entrance of several of the sounds, a narrow bar or belt of soundings from 30 to 50 fathoms will be found to extend across, where, under favourable circumstances, a vessel may drop a kedge with a hawser, and thus prevent being carried out with the ebb tide; the outset causes the influence of the flood to be but little felt.

Daylight is the best time in a sailing vessel for leaving these anchorages, when a land wind prevails for a few hours; indeed, unless the wind is blowing directly in, a vessel will seldom have any difficulty in getting to sea. Near the coast a constant current of nearly one mile an hour sets to the south-west.

The prevailing winds on this coast are from north-west to south-west, the former frequently bring rain and thick weather, and as the shore is approached generally veer to the northward; south-west winds are fine and clear; rain is of very frequent occurrence, and often lasts for several days together without intermission; and enclosed as these inlets are by mountains of such stupendous magnitude, except for about two hours before and after noon, the sun is rarely visible; indeed, it would be difficult to find an acre of level land in any part, and that an almost impenetrable forest.

Excellent fish of several kinds are abundant, and may be caught with hook and line close to the rocks at the entrances, or wherever there is a shoal patch; crayfish abound in the southern ports, also several species of ducks, pigeon, and the weka or wood-hen; those rare birds, the kakapo and kiwi, so eagerly sought after by naturalists, and peculiar only to New Zealand, were found here in considerable numbers; no inhabitants have been met with since the few stragglers seen by Cook.

The sand-flies noticed by Cook are of a most virulent kind, and it was with great difficulty that the necessary astronomical observations on shore could be made by the officers of H.M.S. *Acheron*, who were frequently compelled to take refuge from their torments among the thick foliage a short distance from the beach, where, strange to say, they do not penetrate; these plagues invariably left the vessels at dusk, and did not reappear until the following daylight.

The foregoing brief description may be appropriately closed by the following extract from the journal of Commander G. H. Richards, H.M.S. *Acheron*, engaged in the survey of the coast in 1851:—

"A view of the surrounding country, from the summit of one of the mountains bordering the coast of from 4,000 to 5,000 feet elevation, is perhaps one of the most grand and magnificent spectacles it is possible to imagine; and standing on such an elevation rising over the south side of Caswell sound, Cook's description of this region was forcibly recalled to mind. He says, 'a prospect more rude and craggy is rarely to be met with, for inland appeared nothing but the summits of mountains of a stupendous height, and consisting of rocks that are totally barren and naked except where they are covered with snow.' We could only compare the scene around us as far as the eye could reach, north to Milford haven, south to Dusky bay, and eastward inland for a distance of 60 miles, to a vast sea of mountains, of every possible variety of shape and ruggedness, the clouds and mist floated far beneath us, and the harbour appeared no more than an insignificant stream; the prospect was most bewildering, and even to a practised eye the possibility of recognising any particular mountain, as a point in the survey from a future station seemed almost hopeless."

PRESERVATION INLET, the southern of this series of remarkable sounds, lies at the south-west extreme of the Middle island, 80 miles from port William the nearest port of Stewart island, and the same distance from Bluff harbour.*

Its entrance lies between Puysegur point and Gulches head, which are 4½ miles distant from each other in a north-west and south-east direction. The southern point, Puysegur, as before noticed (*see* p. 288), is a low sloping projection.

LIGHT.—On Puysegur point, a *flashing* white light, showing a flash every *ten seconds*, elevated 180 feet above the sea, is exhibited from a white tower 40 feet high, visible in clear weather from a distance of 19 miles.

Gulches head (the dividing point also between Preservation and Chalky inlets) is extremely rugged and cliffy, with rocks above water extending 2 cables off, as also a sunken rock, detached and generally breaking, one-third of a mile south of it.

Coal island, 850 feet high, 2¾ miles long north and south, and 1¼ miles wide, lies between these points, and divides the entrance, the northern or main entrance being 1½ miles in width; the southern, merely a boat channel of refuge for small vessels in case of emergency, is called Otago retreat.

Balleny reef lies off the main entrance, its nearest point bearing S.S.W., three-quarters of a mile distant from Gulches head; this reef, partly awash, is 1¼ miles in extent in a south-west and north-east direction, and always breaks heavily. There is a ship channel between it and Gulches head, half a mile in breadth, called Broke-adrift passage, with from 7 to 12 fathoms, irregular rocky bottom; but unless with a fair wind, vessels are not recommended to take it, and they must then be careful to pass outside the sunken rock, one-third of a mile south of Gulches head.

Table rock, a flat rock 20 feet high, lies W.S.W. 2¼ miles from Gulches head, and N.W. by W. ½ W. one mile from the outer rock of Balleny reef, with deep water close-to, and a passage between it and the reef.

APPROACH.—From the southward or eastward, Preservation inlet will be readily known, being the first opening seen. From the westward the high white cliffs of Chalky island, at the entrance of the inlet of that name, and 2 miles westward of Gulches head, are an excellent guide; also Treble mount, which reaches an elevation of 3,380 feet, and makes from the westward, with two peaked summits. This mountain is remarkable; it rises from the centre of the peninsula separating Preservation from Chalky inlet, is visible a long distance seaward, and bears from the main entrance N.N.E. distant 7 miles.

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* *See* Admiralty chart, Preservation and Chalky inlets, No. 720; scale, $m = 1 \cdot 0$ inch.

Entering Preservation inlet with a north-west wind it must be remembered that, as the port is approached, this wind always draws to N.W.N., or even more northerly, so that with the current, which sets out and to the southward with considerable strength, a dull sailing vessel will rarely fetch in through the entrance, which lies north-east and south-west. The Balleny reef should therefore be hugged within less than half a mile,—its edge is well defined,—and Gulches head be kept pretty close on board; if Coal island cannot be weathered, a vessel should not stand far over towards it, as the outset is very strong on that shore, but keep to the north shore until as high up as Price's beach, which is the first sandy beach one mile above Gulches head; and off which, in Welcome road, a vessel may anchor in north-west winds, in 8 fathoms, 3 cables from the beach; this, however, is only a stopping place, and with south-east winds, there is always a swell in the outer part of the inlet, until round Cavern head, which bears from Gulches head N.E. by E. ¾ E. distant 3 miles.

Sunken reef.—Between Gulches and Cavern heads a bay runs 1½ miles to the northward, its sandy beach meeting within half a mile of South port in Chalky inlet. Two cables within the line of these heads lies a dangerous reef which does not always break; it bears from the outer end of Price's beach E. by N. ½ N. 1⅒ miles; from Cavern head W. by S. ½ S. one mile; and from Spit islet, a high rugged craggy rock connected with the north shore by a sand-spit, S. by W. ½ W. half a mile: there are 17 fathoms close to this reef. Entering with a leading wind a vessel will be well clear of the reef so long as she does not stand inside the line between Gulches and Cavern heads; working in there is a passage three-quarters of a mile wide between Pinnacle rock, at the north point of Coal island, and the reef which bears from it N.W. ½ N., and when Spit island bears North a vessel will be inside it. The depth of water in the outer part of the inlet is from 20 to 16 fathoms until between Cavern head and Coal island, when it increases to 45 fathoms.

Cavern head is a rugged and broken point, on which a swell is always breaking, its summit is a saddle-shaped hill; several rocks above and below water are scattered to the westward of it, and a sunken rock lies 1½ cables W.S.W. from the extreme; this headland should not be rounded very close, and in working a vessel should not stand so far to the northward as to shut in the southernmost Cording islet with it.

Cuttle cove, the first sheltered anchorage, lies one mile northward of Cavern head; after rounding this head the passage is between the western shore and Cording islets, and in the narrowest part is scarcely 4 cables wide; the cove will be known by being the third bight above Cavern head, with a small islet (Single tree islet) lying off it; the anchorage is between this islet and the mainland, in from 10 to 15 fathoms mud, and is snug and well sheltered.

Cording islets, a chain of four islets and some smaller rocks, lie north-eastward of Cavern head; there are channels between them through which vessels may pass, if necessary, in working up for Cuttle cove. Vessels so working up should pass to the northward of the largest Cording islet, at the distance of a cable from its northern point, as a sunken rock lies 2 cables northward of that point; but with north-west winds it is recommended to work up to the westward of the islet. In standing to the eastward, between the south Cording islet and Steep-to island, which lies close off the north-east point of Coal island, the Whale rock must be avoided; this rock is awash, with deep water all round it, and bears North distant a quarter of a mile from the north end of Steep-to island.

Round islet and Wood-hen island, which lie eastward of Cording islets, have no dangers about them but what are visible, and may be approached close to.

Steep-to or Crayfish island is a quarter of a mile northward of the north-east end of Coal island, and connected with it by a reef with only 3 feet at low water. A rocky head projecting from its western side affords shelter for a small vessel, which, having entered the port with a strong north-west wind, is unable to work up for Cuttle cove; she should then anchor as close as possible under the rocky head, and about a cable from the shore, in from 10 to 6 fathoms. The reef which connects the two islands is only 2 cables south of the head; she must also be careful not to drop her anchor until soundings are obtained, as the water decreases suddenly from 33 to 10 fathoms; this small anchorage, known to the whalers as the Neck of Crayfish island, or Fishing bay, does not afford shelter for more than one vessel, and is not recommended when Cuttle cove can be reached.

Isthmus sound.—The upper part of Preservation inlet, above Cording islets, branches into several arms. Isthmus sound, the westernmost, runs in a northerly direction 3 miles, with an average width of half a mile; there is a depth of 45 to 25 fathoms within a quarter of a mile of its head, and in its central part no bottom was found with 56 fathoms of line. The western side of this sound is a continuation of the coast from Cuttle cove, and vessels may enter it on either side of Cording islets; if from their western side, the sunken rock, before mentioned as lying northward of the largest islet, must be avoided. The head of Isthmus sound is separated from Long sound, situated northward of it, by a narrow neck, one cable across.

Useless bay runs parallel with Isthmus sound, being one mile to the eastward, and separated from it by a narrow tongue of land, of which Colt head is the southern extreme; it is in all respects a similar sheet of water, and its head is likewise separated from Long sound by a neck of land 2 cables across.

Revolver bay, the entrance to which is immediately opposite Useless bay, runs in a southerly direction for one mile, with a breadth of one-third, and a more moderate depth of water, having anchorage in 12 fathoms a quarter of a mile from its head. Vessels desiring to enter either of these bays should steer for Colt head, which bears N.E. by E. ¾ E. $2\frac{6}{10}$ miles from Cavern head; passing to the southward of it, and then standing up the reach to the north-east for three-quarters of a mile, they will be abreast both entrances.

Long sound runs in a north-easterly direction, and extends 14 miles above Colt head. To enter it, having passed that head and the entrances of Useless and Revolver bays, steer through Narrow bend, which runs north-east 2 miles to Sandy point on the eastern shore, round which, in Harries bay, there is anchorage in 15 fathoms 1½ cables from the beach. From Harries bay the sound opens out to the width of one mile, and takes a north-westerly direction for 2½ miles, when it resumes its north-easterly trend, and maintains the same width until as high as the Only isles, which lie on the eastern shore. Above these it narrows to half a mile, and terminates 3 miles above in Cascade basin, with a very narrow entrance and a waterfall at its head; in this basin the depth is from 8 to 10 fathoms.

The soundings in Long sound, unless close to either shore, are very deep; 24 fathoms will be found inside the Only isles, where an anchor might be dropped if necessary. On the western shore, three-quarters of a mile above Trevaccon head,—a high cliffy projection, 2 miles above the north-westerly bend,—is a small cove, which runs to the westward a quarter of a mile, and is nearly a cable in width, with a depth of 4 fathoms; a vessel might haul into it and secure herself. With these exceptions, there is no anchorage in the sound in a convenient depth of water.

South entrance of Preservation inlet,* as before observed, lies between the south end of Coal island and Puysegur point, and may be used with advantage by small vessels arriving off Preservation inlet with a strong north-west wind, and not able to work in on account of the current or from other causes. The entrance is narrow, and a sunken reef lying in the centre leaves the passage, which is between the reef and the point of Coal island, not more than 2 cables wide. A vessel intending to take the channel must get well to windward before bearing up for it, and then hug the point of Coal island as close as possible—within her own length—and if not able to lay through, should drop anchor as soon as under the lee of it, in 8 or 9 fathoms, and immediately send a hawser to the rocks on the island shore; if blowing too hard to warp further up, the end of a chain should be carried on shore and secured to the rocks, when she will lie in perfect safety. In a moderate gale a vessel may warp up by the island shore for half a mile, when good anchorage in 4 fathoms will be found, in perfectly smooth water. A mile within the entrance a bar of sand extends across, with only 6 feet at low water, so that a vessel over that draught must wait for the tide to proceed higher up.

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* The *Otago* schooner, drawing 10 feet water, hired as a tender to H.M.S. *Acheron*, having gained so far to windward as Balleny reef, was driven to leeward by a strong north-west wind and the prevailing current, and took refuge in this entrance, securing herself as before described; she thus escaped being carried back through Foveaux strait, a circumstance which had occurred a few weeks previously (before this channel had been examined), when, in consequence of the prevailing westerly winds, she did not

When anchored in one of the snug coves of Preservation inlet, very little idea can be formed of the weather outside, and a boat should always be sent to Cavern head to observe it before putting to sea.

Tides.—It is high water, full and change, in Cuttle cove at 11h. 20m.; springs rise 8, neaps 4 feet; the ebb runs out at the rate of about one knot. The flood tide is but little felt in the inlet; it runs eastward between Gulches head and Balleny reef, and sets across the entrance to the south-east.

Supplies.—A stream of fresh water runs into Cuttle cove, affording a good supply, and wood may be cut in any quantity. Pine spars may also be procured with much facility a short distance inland, and on the islands. Excellent fish of several kinds are abundant in Preservation inlet, and at the south entrance may be taken with hook and line in almost incredible quantities. Crayfish also abound in most of the coves.

CHALKY or DARK CLOUD INLET* lies immediately north-west of Preservation inlet, being only separated from it, as before remarked, by a high peninsula, of which Gulches head is the southern extreme. Its entrance is well denoted from seaward by the white cliffs of Chalky island, which lies in the centre of it, and also by the lofty mount Treble, rising over its eastern side. Cape Providence, its western entrance point, 300 feet high, lies 6¼ miles S.S.E. ¾ E. of West cape, and is sur-

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regain her port for a fortnight. It is only under such circumstances that a vessel is recommended to run for it.

The north-west winds blow with great violence round this end of the Middle island, and such a heavy sea gets up, that H.M. steam-vessel *Acheron* had to put back several times in endeavouring to reach Chalky inlet from Preservation inlet, when a distance gained of one mile would have taken her round the dividing point, Gulches head.

* *See* Admiralty chart, Preservation and Chalky inlets, No. 720; scale, $m = 1{\cdot}0$ inch.

rounded by reefs and sunken rocks, which extend from it one mile to the southward.

The main arm of this inlet runs in a N. by E. direction 8½ miles from the south-east point of Chalky island, with a breadth of nearly 1½ miles, when it divides; Edwardson sound continuing the northerly trend for 6 miles further, and Cunaris sound taking an E.N.E. direction for almost the same distance, the eastern head of the latter meeting within little more than one mile of Long sound in Preservation inlet.

The principal anchorages are South port and North port, the former on the eastern side, 4 miles above Gulches head, and the latter on the western, 6 miles within cape Providence. Chalky island with the Passage islands, immediately northward, lie in the middle of the entrance, leaving a wide ship channel on either side of them.

The Eastern passage, between Gulches head and Chalky island, is the most convenient for vessels from the southward; Balleny reef and Table rock, which have been already described in treating of Preservation inlet, lie across the entrance of it, and vessels may enter either by the passage between Gulches head and Balleny reef, or between Chalky island and Table rock; the latter bears S. ½ W., nearly 2 miles from the south-east end of Chalky island, and this passage is by far the best; it has 20 to 25 fathoms water, and is entirely free from dangers. There is also a passage between Balleny reef and Table rock, but it has not been closely examined, and is therefore not recommended. When inside the point of Chalky island, the width of the channel is 1½ miles, and the depth from 60 to 70 fathoms; in working through, vessels should not approach near the north-east end of the island, as Pinnacle rock and several scattered rocks under water extend a quarter of a mile off it. The passage between Chalky and Passage islands has many rocks scattered about, and it is by no means recommended.

The Western passage, between cape Providence and Chalky island, is the best for vessels entering from the north-west, as with a wind not to the northward of north-west they would lay through and fetch South port.

In taking this passage, the reefs awash and sunken off cape Providence are the only dangers to be avoided; the former extend southward three-quarters of a mile, and the sunken rocks S.W. ½ S., one mile from the Sugar-loaf rock at the cape extreme. The cape should therefore be given a berth of 1½ miles until it bears North, when a vessel may haul up north-east between the western shore and the islands; steering 3 miles in this direction Return channel will be opened out, which lies between the north end of Passage islands and the south end of Great island, and is more than half a mile in width, with a depth of 22 fathoms;

in rounding the south-east point of Great island, care should be taken not to approach it under a quarter of a mile to avoid Sunk rock. From the north end of Passage islands the entrance to South port bears East, distant 2 miles.

Sunk rock, a pinnacle rock with 5 feet on it at low water, and 5 to 9 fathoms close around, lies one cable southward of Seal rock at the south point of Great island.

In entering the western channel, an extensive bight, Landing bay, will be seen immediately within cape Providence; there is good landing at its head in north-west winds, and temporary anchorage, if necessary, may be had at its entrance in 9 fathoms, but it shoals suddenly within. On the same shore 2 miles above this bay, is Breaker point, the western point of the blind entrance to North port; breakers extend half a mile off it, and vessels should be cautious not to stand up Blind entrance, as there are only a few feet water a short distance within.

SOUTH PORT is a deep bight, penetrating the eastern shore of the inlet nearly 2 miles in a S.E. by S. direction, with a breadth, when inside, of nearly half a mile; the entrance, which is 4 miles above Gulches head, is rendered very narrow by the islets and rocks which lie in it; the narrowest part is less than a cable wide, so that vessels can only enter with a leading wind, or tow in during a calm.*

From the western entrance point, two islets (Garden isles) extend in a northerly direction 4 cables, which must be passed to the northward, as there is only a boat channel between them and the south shore. A rock awash lies in the centre of the entrance a long quarter of a mile N.E. by E. from the north point of outer Garden island; from the north-east point of the inner Garden island shoal water extends eastward 1½ cables, with only 6 feet water at its outer extreme, which is marked by kelp; and from Reef point, the eastern entrance point, a reef of rocks extends towards this 6-feet patch; here is the narrowest part of the channel, and having passed through it about a cable, the port opens out to a width of half a mile.

Good shelter will be found in Anchorage cove, on the port hand, immediately within Reef point, in from 14 to 9 fathoms, 1½ cables from the beach; here vessels may lay in perfect security, and wood and water can be obtained with great facility. Above Anchorage cove the port narrows to little more than 3 cables in width, and the water deepens from 15 fathoms to 30 and 36 fathoms; this depth is carried almost to the head, which is separated from Preservation inlet by a low swampy neck half a mile across, and covered with trees.

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* *See* plan on Admiralty coast chart, Foveaux strait to Awarua river, sheet XII.,

Vessels entering Chalky inlet by the eastern channel, intending to anchor in South port, should pass northward of Garden islands and the rock awash, at a convenient distance; having passed the latter, haul up the bay keeping the eastern shore on board within a cable; on nearing Reef point, look out for the 6-feet patch, which bears W. ½ N. from it. The patch may be passed close-to in 10 fathoms, but if not seen, Reef point must be kept on board within less than a cable until past that bearing; and in hauling into Anchorage bay, the point must not be rounded very close, as shoal water extends for more than a cable southward of it.

Entering by the western entrance for South port, when Return channel is open, Stripe head with its jib-shaped patch, on the eastern shore, will be seen, when a course should be steered midway between it and Garden islands, and as soon as the rock awash in the entrance is passed, proceed as before directed.

NORTH PORT, on the western side of Chalky inlet, 5 miles above cape Providence, lies between Great island and the mainland, which are connected by a bank (Sand bar) with only 6 feet water from about the centre of the island; the south entrance to this port becomes in consequence a blind one.*

Little island lies across the centre of the north entrance to North port; Ship entrance is between its south point and the north end of Great island; the channel is narrow, being little more than half a cable wide, with a depth of 6 and 7 fathoms, the shores on both sides being steep-to. When a cable within the entrance the port opens out to a width of 3 cables, and the anchorage is in the centre, 2 cables from Little island in 14 fathoms, mud bottom, and perfectly landlocked; the port runs to the westward three-quarters of a mile with a depth of 15 and 18 fathoms water, when it shoals suddenly to 2 fathoms on the bank which connects Great island with the main. Between Little island and the north shore is a boat channel.

North port is easy of access with a leading wind, but the entrance lying in a westerly direction, is opposed to the prevailing winds, and is therefore not so convenient a harbour for sailing vessels as South port, but for a steamer it is certainly preferable.

Edwardson sound, the northern portion of Chalky inlet, is bounded on either side by steep and rugged mountain ranges from 3,000 to 4,000 feet elevation; the depth of water in its central parts exceeds 100 fathoms, and the shores are steep and free from dangers to the head, which terminates in Lake cove, where there is a moderate depth for anchoring.

Cunaris sound, the north-east arm of Chalky inlet, has an equally great depth of water; its head terminates in two coves, in which from 15 to 24 fathoms will be found.

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* *See* plan on Admiralty coast chart, Foveaux strait to Awarua river, sheet XII., No. 2,589.

Small-craft harbour islets lie on the south shore, at the junction of the two last-named sounds; a small cove is formed on their southern side, where small vessels may anchor in 8 fathoms; from 25 to 15 fathoms will be found between them and the south shore in a shingle bay.

Tides.—It is high water, full and change, in the ports of Chalky inlet at 11h. 5m.; springs rise 8 feet, and neaps 4 feet.

WEST CAPE.—From cape Providence to South point, the south entrance head of Dusky sound, is 12 miles in a N. by W. ½ W. direction. West cape lies midway between, and projects about half a mile from the general trend. There are no dangers extending any distance from this coast, and vessels may approach it within one mile; at the distance of 2 miles from the shore, there is a depth of 40 to 50 fathoms.

DUSKY SOUND, or bay, as it was named by Cook when he first discovered the opening, lies between Five Fingers point and South point; the width between being 4 miles. Approaching from the southward, Chalky island will be found a good guide to the entrance, as will also West cape, which will appear as a well-defined projecting point of moderate height, dropping a short distance within its extreme, and then rising again with a gradual slope towards the high land.*

From the northward Five Fingers point cannot fail to be recognised; it is the south-west extreme of Resolution island, which separates Dusky from Breaksea sound. Several high pointed rocks stand off its extreme; these, when viewed from certain situations, give it the appearance of the fingers of a man's hand, from which circumstance it received the name from Cook; as that navigator also observes, "the land about the point is still more remarkable by the little similarity it bears to that adjacent to it, being the extreme of a narrow peninsula, lying N.N.E. and S.S.W. for 8 miles, of a moderate and equal height, and covered with wood."

Dusky sound runs in an E.N.E. direction 22 miles, and is studded with numerous islands and rocks, but has few dangers that are not visible.

Anchor island, 3½ miles long, rising to an elevation of 1,360 feet, lies immediately within the entrance, in the direction of the sound; and is surrounded by a labyrinth of small islets. A small harbour on its north side, about the centre of the island, affords secure anchorage, being sheltered from the northward by the Petrel islands, which lie immediately off its entrance. Vessels entering the sound northward of Anchor island with a strong north wind, and unable to work up for Facile harbour, might find it convenient to anchor here; but otherwise it is not recommended, on account of the difficulty of leaving with the prevailing winds: a passage in will be found either to the southward or northward of Petrel islands.*

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* *See* Admiralty chart, Dusky and Breaksea sounds, No. 719; scale, $m = 1 \cdot 0$ inch.

Entering by the southern passage, a vessel may pass on either side of Entry island, a small island a quarter of a mile S.W. of large Petrel island; if to the northward, the south-west end of large Petrel island should be kept close on board, to avoid a sunken rock with 13 feet at low water, which lies S. by W. ½ W. one cable from that point; if southward of Entry island, it must also be passed close, to enable a vessel with a northerly wind to weather a rock above water that lies nearly in the middle of the harbour entrance. This rock may, however, be passed on its south side, if necessary; having passed it, steer south-eastward for the entrance of the harbour, distant little more than a quarter of a mile, and anchor in 16 fathoms, a cable from the shore: the width of the harbour is about one cable. The passage northward of Petrel islands, is the widest, and with a north wind the best; these islands are bold to, and passing between the large Petrel and the east point of the harbour, take up a berth as before directed. Vancouver's ship, the *Discovery*, rode out a heavy gale from north-west here in safety.

South-westerly winds roll a heavy sea into the entrance of Dusky sound, but is broken by the numerous islands; smooth water is found a short distance within.

The principal anchorages in Dusky sound are, Pickersgill harbour and Cascade cove on the south side, Facile harbour and Duck cove on the north; temporary anchorages may also be found in other parts, but the depth of water in general is very great, and they cannot be recommended unless in case of necessity.

Directions.—Vessels entering from the southward with a leading wind should pass about half a mile from the south entrance point, and steer up the sound, keeping that shore on board at about the same distance, passing southward of all the islets that lie off Anchor island. Soundings from 20 to 30 fathoms will be found at the entrance, and until abreast the outer end of the island, when no bottom is obtained at 80 fathoms. A reef of rocks above water, or awash, extends one-third of a mile off the south shore, nearly 3 miles within South point, just above two small islets on the same shore. The first indentation is Shelter cove, three-quarters of a mile above this reef; it is only fit for boats.

Pickersgill harbour* is 5½ miles above South point, and immediately abreast the west end of Indian island, which is 1½ miles long, lying in the direction of the sound, and half a mile from the south shore.

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* *See* plan on Admiralty coast chart, Foveaux strait to Awarua river, sheet XII., No. 2,589.

Crayfish island lies across the entrance of the harbour. The narrow passage, by which Cook entered, is that westward of this island; the best channel, nearly a cable wide, is to the eastward, avoiding a half-tide rock which lies a short distance from the shore of the mainland, and bears S.S.E. from the east end of Crayfish island; by keeping the island close on board, this rock will be cleared, and within there is anchorage in 15 fathoms, a cable from the shore. Wood and water may be procured here with much facility, and though a confined anchorage, Cook considered it not inferior to any other in the sound for two or three vessels.

Cascade cove is three-quarters of a mile above Pickersgill harbour, and has two small islands lying off its entrance; S.E. from their south end, and midway between it and the shore, is a rock awash. The cove is one-third of a mile wide at its entrance, with a depth of 26 fathoms, and runs 1½ miles in a S.W. ½ S. direction; three-quarters of a mile from its entrance a sandy point, projecting from the southern shore, narrows it to less than 2 cables, but it opens out again above, and good anchorage may be had in from 12 to 15 fathoms for several vessels. The head of the cove terminates in a sandy beach, which dries out some distance at low water, and through which flows a considerable stream; the cascade, from which this anchorage received its name, is on the eastern side of the entrance.

Long and Cooper islands.—Immediately above Indian island are Long and Cooper islands; these three islands form a chain extending nearly to the head of the sound, with a navigable channel both north and south of them. Long island is 7 miles in length, with an average width of one mile, tapering at either extreme; its west end is almost connected with the eastern extreme of Indian island by a chain of islets and rocks with no ship channel between. Cooper island is 4 miles in length, with a channel between it and the east end of Long island 2½ cables broad, and a depth of 36 fathoms.

To sail up the sound south of these islands, vessels after passing Pickersgill harbour should keep to the southward of the two small islands off Cascade cove; above these islets the channel becomes narrow, in some places not more than 2 cables wide, the depth of water ranging from 35 to 70 fathoms; in consequence of this, and the high range of almost perpendicular mountains which extend in one unbroken line along the southern side of the sound, the navigation for a sailing vessel would generally be found tedious and difficult. As the east end of Long island is approached, the channel increases in width to nearly three-quarters of a mile, and continues so until advanced half-way along the coast of Cooper island, when a cove will be seen on the southern shore, but with a depth of water too great for anchorage. Above this cove the channel again narrows, and between the east end of Cooper island and the south shore is not more than 120 yards across (Nine-fathom passage), with rocks extending from the island shore.* The sound extends 3½ miles above Cooper island, with a breadth of half a mile, and terminates in two coves, in the northernmost of which anchorage may be had in 12 fathoms, a cable from the sandy beach at its head, through which flow two large and rapid streams.

Facile harbour,† on the north side of Dusky sound, is a deep water anchorage, formed between Parrot and Pigeon islands and the eastern shore of the mainland, its entrance bearing N.E. by N. 4½ miles from Five Fingers point; Cook recommends this harbour for vessels bound to the southward, and undoubtedly they would get easier to sea, with a northerly or north-west wind, than from the ports on the southern side.

Entering the sound between Five Fingers point and Anchor island there is a clear working width of 1¼ miles without dangers, the depth of water from 50 to 90 fathoms. Vessels bound for Facile harbour with a leading wind, after rounding Five Fingers point, should keep the northern shore on board within half a mile until abreast Parrot island, 4 miles from the point; when the northern end of this island is rounded the entrance of the harbour will bear East, distant 1¼ miles. The harbour lies in the north-east bight of the bay, and is somewhat less than a cable in width, with a small islet on either side; there is safe anchorage within, in from 15 to 33 fathoms, and a snug cove in the north-east corner, where the remains of a large ship still exist. In leaving Facile harbour, it will often be convenient with westerly winds to pass between Parrot and Pigeon islands; the channel is scarcely a cable wide, with a depth of from 5 to 9 fathoms in the narrowest part; between Pigeon island and the mainland there is only a boat channel.

Danger.—A ledge of sunken rocks, with 9 feet water over it, lies in the centre of the entrance to the cove on the north-east side of Facile harbour.

In the bight northward of Facile harbour are Cormorant and Goose coves, the former has a north-easterly trend, and is a snug anchorage with a moderate depth; Goose cove is a shallow tidal estuary, and is separated by a low narrow neck from the head of Wood-hen cove, on the sea face of Resolution island.

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* Mr Garrard, commanding the steam-vessel *Albion*, reports the existence of a sunken rock in Nine-fathom passage, and to lie about 30 yards from the shore of the mainland.—*New Zealand Government Notice*, 1880.

Capt. Fairchild observes :— "The Garrard rock is 114 feet from the mainland, and has only one foot on it at low water. Vessels using this passage should be careful to keep in mid-channel, where the depth is 4 fathoms, between some rocks above water on the Cooper island side and the mainland."—Brett's New Zealand Pilot, 1880.

† *See* plan on Admiralty coast chart, Foveaux strait to Awarua river, sheet XII., No. 2,589.

Duck cove[*] is easy of access, and is a convenient anchorage for vessels under any circumstances; it lies on the north side of the sound 3¼ miles N.E. ¼ N. from the north-west end of Indian island, is a quarter of a mile wide at its entrance, and runs in a N. by W. direction three-quarters of a mile, narrowing towards its head to a cable; mountains rise on either side to elevations of nearly 3,000 feet separated by a valley at its head, through which a large stream runs into the cove. H.M.S. *Acheron's* anchorage was in 11 fathoms, 1½ cables from a boulder beach on the eastern shore, and half a mile within the entrance.

Danger.—A sunken rock, with about 6 feet water over it at low water, lies W. by N. from Porpoise point (the eastern point of Duck cove) distant about 3 cables.

Vessels bound for Duck cove, and entering Dusky sound by the southern passage, should keep the south shore on board, as before directed, until reaching Indian island, and after passing a convenient distance along its north side, steer north-east for the entrance of the cove, where soundings in 30 fathoms will be found, which decrease gradually to 15 and 10 fathoms at its head.

If entering from the northward, after passing Anchor island, steer through the channel between its eastern end and the mainland; there are no dangers in it but what are visible. Leave Useless islands on the port hand, and pass mid-channel between them and the south-east point of Anchor island, avoiding the Seal rocks awash, which lie S.E. by E. one-quarter of a mile from the latter point; when these are passed steer towards the eastern end of Indian island, or S.E. by E. until the sound above opens out, when haul up north-east along the north shore, and enter the cove, as before directed. A small cove will be seen immediately westward of Duck cove, with an islet at its entrance, but it is too small to afford anchorage.

Tides.—It is high water, full and change, in Duck cove at 10h. 50m.; springs rise 10 feet, and neaps 6 feet.

Close off the outer east point of Duck cove, which is a prominent point, stands Porpoise rock, and E.S.E. from it, distant three-quarters of a mile, on the north coast of Long island, is Detention cove, a small nook, where Cook found temporary anchorage in 14 fathoms. Hence the sound runs in a north-east direction, with depths varying from 120 to 160 fathoms. Three miles above Porpoise rock is the entrance of the arm which leads into Breaksea sound; two small islets lie immediately abreast this entrance, borrowing on the Long island shore; within them is a rock awash. Two miles above, and in mid-channel, is another small group,

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[*] *See* plan on Admiralty coast chart, sheet XII., No. 2,589.

Shag isles, whence the sound continues clear along the north shore of Cooper island to its head, maintaining an average width of two-thirds of a mile, with a great depth of water.

Acheron passage, the arm connecting Dusky and Breaksea sounds, runs in a N.N.W. direction 8 miles, with an average width of half a mile, and is formed by the eastern shore of Resolution island and the mainland. High, precipitous and wooded, mountains rise on either side to heights varying from 3,000 to 4,000 feet. Soundings were only obtained in the middle of the channel at depths of 200 fathoms, and so perpendicular are the shores that 80 fathoms were found within a few feet of them. There are, however, two or three places where an anchor may be dropped if necessary.

The first of these temporary anchorages is in a small sandy bight close within Passage point, at the southern entrance of the arm; here a depth of 13 fathoms will be found, but, being open to a long reach of the sound to the southward, is exposed to south-west winds, and therefore cannot be recommended when any other can be obtained. The second is on Resolution island, in a bight 2½ miles northward of Passage point, and bearing S.W. by S. from the south entrance point of Wet Jacket sound. Here the depth is from 9 to 12 fathoms, and a vessel may secure to the trees.

Wet Jacket sound is a deep indentation penetrating the eastern shore of the arm 6 miles in a N.E. by E. direction, with a width generally not exceeding one-third of a mile. Anchorage may be obtained at its head in from 18 to 10 fathoms, but in other parts it is very deep.

The next anchorage is in Occasional cove, on Resolution island, near the north entrance of the arm, 3 miles from Wet Jacket sound; here Cook anchored in 16 fathoms, and moored with a hawser to the shore; the entrance of Breaksea sound is just shut in from this anchorage.

OUTER COAST of RESOLUTION ISLAND.—Returning now to Five Fingers point and proceeding northward, the outer coast of Resolution island trends N.N.E., and is somewhat remarkable, as before observed, from being lower than the neighbouring land. Two miles northward of the point, and a quarter of a mile from the shore, stands a small islet, 70 feet high; at 4 cables from this islet, in a S.W. ½ S. direction, is a smaller rock and reef, and the same distance farther in the same direction, another rock which occasionally breaks. This latter danger extends half a mile from the shore, which should not be approached here within 1½ miles. The coast line is now nearly straight to Wood-hen cove, a distance of 8 miles from Five Fingers point: this exposed cove is nearly one mile in length, with a width of about a cable, and only shelters boats; from it the coast rounds away north-east towards the entrance of Breaksea sound.

BREAKSEA SOUND, which is noticed by Cook,—who did not explore it to its head,—as the northern entrance of Dusky bay, in consequence of his having passed to sea through it by Acheron passage, the arm which connects the two, already described, has been considered of sufficient extent to demand a distinctive appellation; it has therefore received the name of Breaksea, from the island at its entrance, which was named by that great navigator himself. This island, which is about 3 miles in circumference, and considerably lower than the mainland, lies N.N.E. 12 miles from Five Fingers point; the entrance of the sound, being rather narrow and surrounded by very high land on either side, is not easily distinguished until within a few miles of it, when Breaksea island and the smaller islets which lie on the south side of the entrance will be readily made out; from seaward also, it is remarkable from the comparatively low land to the southward, the first craggy mountains north of Five Fingers point rising over its south side.

There is a passage on either side of Breaksea island; that to the northward is the best, being one mile wide, and entirely free from dangers. If the south channel is taken pass southward of three small islands south of Breaksea island, between them and Gilbert islands; this passage is not more than half a mile wide. The passage between Breaksea island and the three small islands is not recommended, as a long reef extends from the south side of the former island, rendering it very narrow.

Gilbert islands are two distinct groups, more than half a mile apart, extending off the south entrance point of the sound, with an apparently deep bight between them, but which offers no shelter and is much exposed. The only anchorage among these islands is Stevens cove, a small place, with a depth of 4 fathoms, sufficient only to hold one vessel of moderate tonnage by securing to the trees, and where sand-flies are so numerous that it is scarcely possible to remain on board during the day: this cove is on the mainland, just within the eastern group of islands, and to enter it a vessel should pass between the two easternmost of them.

One mile above the eastern Gilbert island, in the middle of the sound, is Entry island. From it the arm leading into Dusky sound runs in a S.S.E. direction, and the main arm of Breaksea sound to the north-east for 8 miles, when it divides into two arms, one continuing the north-easterly direction 6 miles farther, while the other runs easterly for the same distance; the depth of water in both is very great. Half a mile above Entry island 210 fathoms were obtained, and 3 miles above, under a high cliff on the north shore, no less than 284 fathoms; in the arms it is scarcely less, until at their very extremes, where alone anchorage may be had.

The best anchorage in Breaksea sound is on the south side, 2½ miles above Entry island, inside the Harbour islands, which extend 3 miles along that shore. H.M.S. *Acheron* anchored in 12 fathoms, off a sandy beach, between the outermost Harbour island and the mainland, and found excellent shelter; this anchorage may be entered either southward of the first island, or round the north end of the second island, which latter is the widest and best passage. Within the islands above this, the water is too deep for anchorage.

There are three coves called First, Second, and Third coves, on the north side of the sound, but the water in them is also inconveniently deep for anchorage.

DAGGS SOUND.*—From Breaksea island to the entrance of Daggs sound is 12 miles, the intervening coast, running in a N. by E. direction, is steep and cliffy, overlooked by high mountain ranges; about midway between, a slight indentation of the coast line occurs, and a break in the mountains will be observed, through which flows Coal river. Between Breaksea sound and this river some high black rocks stand, one-third of a mile from the shore, and also smaller scattered rocks nearly the same distance off the projecting points. From the south entrance point of the sound, a cluster of rocks will be seen extending a quarter of a mile off, and one mile northward of the north entrance head is a remarkable rocky peninsula point.†

The entrance is one mile wide, which shortly decreases within to 4 cables; the general trend of the sound is E. by S. nearly 5 miles, when it branches into two arms, one taking a N.N.W. direction for 2 miles, and the other south-eastward the same distance. In the entrance and for 1¼ miles within the heads, soundings will be found in from 20 to 30 fathoms, sand bottom, but as soon as the channel narrows, the depth increases to 70 and 90 fathoms. An unusual feature in these sounds occurs here, a 4-fathoms bank nearly in mid-channel, with deep water all round, lies 2¼ miles within the north entrance point and half a mile above where the channel begins to narrow, rather on the north shore. Anchorage may be obtained at the head of the north arm, in 12 to 18 fathoms, 2 cables from a stony beach, with several streams of fresh water running through it.

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* A remarkable scene occurred during our stay in this sound. Our anchorage was at the head of the northern arm, a cable's length from the shore, in 12 fathoms: the change of the moon brought a N.W. gale, with heavy rain, and in the course of a few hours no less than fourteen magnificent cascades were pouring down the steep sides of the mountains (upwards of 3,000 feet high), by which we were surrounded, bringing with them trees of considerable size, and all other obstructions met with in their passage. The effect was as if a heavy surf were breaking round the vessel; the mist, floating as low as our mast-heads, occasionally obscured everything but the summit of the mountains and the foam below, and produced altogether a scene as grand as it is possible to conceive, which lasted without abating in any degree for two days, when the water alongside, which had been as salt as the ocean, was for a considerable depth below the surface perfectly fresh.—Remark Book of Commander G. H. Richards, H.M.S. *Acheron*, 1851.

† *See* Admiralty chart, Daggs sound to Caswell sound, No. 768; scale, $m = 1 \cdot 0$ inch.

The head of this arm communicates within 1½ miles of a similar one in Doubtful inlet, the land separating them being remarkably flat for this country, and thickly wooded. The south-east arm, after running 2 miles in that direction, turns sharply to the north-east, and terminates in Jacob's creek, very narrow, with from 8 to 12 fathoms in it.

DOUBTFUL INLET.—The entrance of this extensive inlet lies 7 miles N. by E. from Daggs sound, the intervening coast being of the same character as that to the southward; the depth of water at the distance of one mile from the shore was found to be 188 fathoms. Its entrance, more than 2 miles in width, with high mountains rising on either side, presents a wide opening to seaward, and will be clearly distinguished from a long distance. Allround peak, and mount Groznoz, on its northern side, from 4,000 to 5,000 feet elevation, are very striking; on a nearer approach Nea islets will be seen extending southward from the north entrance head, and from the south entrance point two remarkable peaked rocks, the Hare's ears, lie at a distance of 3 cables.

The general trend of Doubtful inlet is E. by S. ½ S. for 17 miles, with three arms on its south side extending from 3 to 4 miles in a southerly direction; the north side of the inlet is formed by Secretary island, extending 10 miles in a north and south direction, and 5 miles in its widest part; this island separates the entrance of Doubtful inlet from Thompson sound, which are connected by a short arm 7 miles within the entrance of the former.

Nea islets, extending in a S.E. by S. direction nearly one mile from the north head, and Hare's ears rocks from the southern, contract the entrance of Doubtful inlet to a width of little more than 1¼ miles, with a depth of 50 to 60 fathoms; and on entering, a reef awash will be seen extending a quarter of a mile S.W. by S. from the northern Nea islet.

Two miles within the entrance, Bauza island, 3 miles in length, lies in the middle of the channel, with deep water on either side, but Gaol passage on its south side is the best; the average width of this passage is somewhat less than half a mile, but no soundings were obtained in it at the depth of 80 fathoms. Northward of Bauza island, the channel at its eastern end is not more than a cable across, and the winds in it will generally be found unsteady.

From the outer or north-west end of Bauza island a rocky group,—Shelter islands,—extend in a north-westerly direction in two parallel lines with a passage between 1½ cables wide, and a depth of 12 fathoms; at the south-east end of the northernmost cluster small craft moor in 10 fathoms between the islets. The passage between Shelter islands and the northern shore of the inlet, as also between them and Bauza island, is not recommended for large vessels.

On the north shore, 1½ miles above Flurry head, (the east point of Bauza island,) is a small anchorage in Blanket bay, 1½ miles eastward of which is Common head, the south-eastern extreme of Secretary island; between it and Wood head, a mile to the south-east, is the passage leading into Thompson sound to the northward; this passage is three-quarters of a mile across, and has two small islets rather on its eastern shore.

On the south side of Doubtful inlet, one mile south-eastward of Flurry head, is First arm, running in a south-westerly direction nearly 3 miles, with an average width of 3 cables and a depth of 30 to 50 fathoms; anchorage may be had in Snug cove at its head in 12 fathoms, a quarter of a mile from the beach. Smith sound, the main branch of the inlet above First arm, continues the E.S.E. trend, with an average breadth of 1¼ miles, and having no soundings in its centre at a depth of 120 fathoms; on either side close to the shores there are in places from 17 to 25 fathoms, but no spot where a vessel could drop an anchor.

Crooked arm on the south shore, 4 miles above First arm, runs in a southerly direction 2½ miles, when it turns sharp to W.S.W. for an equal distance; the turning point has a high precipice on either side. The breadth of this arm is half a mile, except at the turn, where it is somewhat less, and in Haul-ashore cove, at its head, there is anchorage in 12 fathoms within 3 cables of the beach, through which flow large streams.

Above Crooked arm the sound trends slightly more to the southward, and its width is contracted to half a mile; on the north shore, 3½ miles above, is a solitary mountain cone, which looking up the inlet from seaward appears very remarkable. A small round islet lies in the centre of the channel abreast this cone, and immediately above it on the north shore is Elizabeth island, with a channel on either side. A mile above Elizabeth island, on the same shore, is Deep cove, whose northern side is a steep precipice, with the Lyvia river running into its head; there is no anchorage in this cove. Rolla island, a small round islet, lies off its south entrance point, and about midway between on a S.E. ½ E. bearing from the island, lies Tarawera rock, small, and having a depth of 10 feet. Halls arm runs thence in a S.S.W. direction 4 miles; its entrance, which is one mile above Rolla island, lies between a high steep cliff on the western shore and a cliffy peninsula point on the eastern; N.W. by N. 2 cables from the latter point is a reef awash. The width between the entrance points is only a quarter of a mile, but within it opens out to three-quarters, with a long beach of sand and shingle on the eastern shore, a cable from which there is no bottom with 70 fathoms; above this beach the arm narrows gradually to its head, which reaches within 2 miles of an arm of Breaksea sound.

The general depth of water in Doubtful inlet is very great; in the main arm soundings were rarely obtained under 120 fathoms, and in the smaller branches from 40 to 70 fathoms. The anchorages are few and not easily found by sailing vessels; with the exception of the small craft anchorage between Shelter islands, that in Blanket bay, and at the heads of First and Crooked arms, there is no place where a vessel could find shelter in a moderate depth of water.

THOMPSON SOUND.—The western shore of Secretary island, which forms the coast line between Doubtful and Thompson sounds, is almost straight and runs in a N.N.E. direction for 8 miles to Colonial head, the north extreme of the island and south entrance point of the inlet. At the distance of little more than one mile from this coast, no soundings were obtained at a depth of 300 fathoms.

The main arm of this sound has a general trend of south-east for 10 miles to its junction with Doubtful inlet, when it turns to N.E. by E. for a further distance of 8 miles, and thence south-east 4 miles. The entrance is only half a mile wide, but is perfectly free from dangers, with a depth of 75 fathoms. For the first 1½ miles it runs in a south-east direction, at which distance Open cove will be seen on the east shore; from 15 to 20 fathoms will be found in this cove, but it is exposed to north-west winds: 2 miles southward of Open cove is a projecting peninsula, with a deep indentation on either side of it. Neck cove, on the north, has several rocks in it and is open and exposed.

Deas cove,* on its south side, though small, is a secure and sheltered anchorage; it lies in a N. by E. direction for 3 cables, with a width less than one cable; the depth of water is from 6 to 16 fathoms. On the west shore the cliffs are steep-to; the eastern shore shoals for a short distance off. H.M.S. *Acheron's* anchorage was in 10 fathoms, rather on the west shore, a cable from the sandy beach at the head, secured also by hawsers to the shore; this is the only convenient anchorage in Thompson inlet.

From Deas cove the inlet resumes its south-easterly trend, with an average width of three-quarters of a mile as far as Common head; the depth of water is very great; just above Deas cove, in mid-channel, soundings were obtained in 250 fathoms, mud bottom.

Bradshaw sound, a continuous arm running N.E. by E. 8 miles, is similar in feature to the outer part of the inlet. Macdonald island lies close off its north shore 1½ miles from the head, and in the bay immediately to the westward there is anchorage in 10 fathoms a quarter of a mile from the shore. Precipice cove which forms the head of the sound above

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* *See* plan on Admiralty chart, Foveaux strait to Awarua river, sheet XII., No. 2,589.

Macdonald island is bounded on either side by high perpendicular cliffs; in the middle there is no bottom at 120 fathoms, but very close to its head, which terminates in a river, there is 10 fathoms. From abreast Macdonald cove, Gaer arm runs south-east 4 miles, with three low islands at its head, outside which it dries at low water: the soundings in this arm are from 53 to 20 fathoms, and anchorage may be had in Shoal cove at its head, in from 14 to 6 fathoms, at a distance of half a mile from the islands.

TIDES.—It is high water, full and change, in Deas cove at 11h. 30m.; springs rise 8 feet, and neaps 6 feet.

NANCY SOUND.—The entrance of this sound is 3 miles from Thompson sound, and is well denoted by Turn peak, a conspicuous sharp-peaked mountain rising over its northern side to an elevation of 4,120 feet; this peak will be distinguished from a long distance seaward, and presents the same appearance viewed from any point. When within 5 or 6 miles of the port a remarkable reddish-coloured patch, caused by a land-slip, will be seen on the high land immediately northward of the entrance, also a white patch on the lower part of the cliffs both north and south of the heads, produced by a similar cause. Two ragged islets project seaward from the south entrance point 2 cables, and Entrance islet, a flat-topped rock, 50 feet high, lies off the north entrance point; the main channel, southward of this rock, is not more than 3 cables wide, with a depth of 30 fathoms.

There is a channel northward of Entrance islet, but a sunken rock lies in the middle, and although the depth of water is sufficient, it is only adapted for boats; the bank of soundings, common to most of these sounds, extends across the mouth of this, with from 30 to 40 fathoms water, but does not continue sufficiently far within to enable vessels to take advantage of it for anchoring.

The trend of Nancy sound on entering is E. ½ S. for 1¼ miles, when it expands to a width of three-quarters of a mile, and runs in a south-easterly direction nearly 5 miles, gradually decreasing in width to 3½ cables, the soundings from 130 to 90 fathoms, and the shores steep-to on either side. A small islet lies close off Bend point, the upper north point of this arm; half a mile S. by E. ½ E. from this islet, anchorage in 15 fathoms will be found, in Heel cove, a hundred yards from the stony beach. Hence the sound turns abruptly to N.E. by E. for a distance of 2 miles, with a width of 3½ cables, and terminates in a stony beach, where anchorage may also be had close to the shore; the soundings in this arm are from 70 to 30 fathoms.

CHARLES SOUND is 4 miles N.N.E. of Nancy sound, with a straight coast between, on which are two boulder beaches; at the distance of little more than one mile from the entrance, no bottom was found at the depth of 230 fathoms. Turn peak, just noticed, rising midway between it and Nancy sound, serves as a good guide to the entrance; from the points to the northward several scattered rocks extend, and one, rather remarkable from being detached, will be seen a quarter of a mile from the shore.

The trend of Charles sound for 4 miles is S.E., with a width of half a mile; the depths at the entrance are 38 to 55 fathoms, increasing within to 110 fathoms. Three miles from the entrance, close to the north shore, is a small islet, with a cove within, but the shores are steep and rocky, and it is exposed and too small for anchorage; there is good landing for boats on the upper side of the islet. One mile above the islet the sound divides into two arms, one running E. by N. 3 miles, the other S.S.E. for the same distance; the average width of these arms is 3 cables, and their depth from 30 to 50 fathoms.

Eleanor island lies at the entrance of the eastern arm, and has a deep-water channel on either side. Near the head of the southern arm are two small groups of low islands, with three rocks above water lying eastward of the first group; these rocks, as also the islets, must be passed on their eastern sides, and anchorage may be obtained above the rocks in 14 to 20 fathoms. Vessels, however, are not recommended to run for Charles sound; there is no convenient anchorage, and the sounds on either side of it are to be preferred.

CASWELL SOUND.—The coast line between Charles and Caswell sounds, a distance of little more than 3 miles, is extremely rugged, with a ridge of high rocks extending from the shore for 3 cables midway between. Unlike any other part of this coast, the water is shoal for a short distance off, with irregular bottom. From 20 to 30 fathoms will be found at the distance of half a mile, but even under favourable circumstances, vessels should not approach nearer than one mile.

The entrance of Caswell sound is narrowed by an island detached from the south head, with a small reef awash off its north end, leaving a passage between it and the north entrance head of 3½ cables wide. To the southward of the island is a boat channel, with a sunken rock in its outer entrance. A narrow belt of comparatively shoal water extends partly across the entrance half a mile outside the island, with 20 to 40 fathoms on it, but immediately within no bottom is found at the depth of 120 fathoms.

The trend of the sound is S.E. ½ S. for 1¾ miles from the north head when it turns to the eastward, and increases to the width of one mile; 2½ miles within the entrance, on the south side, is a projection, Dog point, whence the sound runs E.S.E. for a further distance of 2½ miles, narrowing gradually to a width of half a mile. The shores are very steep on either side, 100 fathoms being obtained within a cable, but in mid-channel no bottom at 130 fathoms.

Close to the north shore at the head of the reach, which runs E.S.E., is **Boat** rock, just awash at high water: a shoal patch of sand extends round this rock, on which, just above the rock, a vessel may drop her anchor in 4 fathoms if necessary, but it is very steep. Hence the sound runs eastward 3 miles, and the best anchorage is 1½ miles above Boat rock, in a small bight eastward of a wooded islet, just detached from the north shore. Here there are 12 fathoms, but the bank is so steep that a stout hawser should be carried to the trees on the east point of the cove, to prevent being driven off by a flaw of wind from the high land. The general depth of water in the sound, above Boat rock, is from 80 to 20 fathoms; at its head is a shallow flat.

GEORGE SOUND.—From the north head of Caswell sound, a steep and iron-bound coast line, broken only by two small bights,—Two Thumb and Looking-glass bays,—trends N.N.E. ¾ E. towards George sound, the entrance of which is distant 13 miles. Two Thumb bay, 3 miles northward of Caswell sound, is a mere indentation of the coast, strewed with rocks which also front the shore for 3 miles to the northward, or as far as Looking-glass bay. The latter bay penetrates the coast in an easterly direction one mile, and is a quarter of a mile wide at its entrance, but wider within; the depth of water is from 9 to 7 fathoms, sand bottom, with a round beach at its head, composed of large boulder stones; it is quite open to the westward.

The Houseroof, a remarkable rock of that shape a short distance off shore, is 2½ miles northward of Looking-glass bay; from it the coast trends slightly more to the eastward, broken with shingle beaches, for 4 miles to the entrance of George sound. No bottom was obtained at the distance of one mile from this stretch of coast, just described, at the depth of 100 fathoms, except abreast Houseroof rock, where soundings were struck in 72 fathoms, rocky bottom.

The first reach of George sound runs S.E. ¾ S. 6 miles, is nearly one mile wide at the entrance, and preserves that width as far up as Anchorage cove. Twenty-two fathoms were found half a mile off the south head, but rapidly deepening within to 50, 80, and 106 fathoms. With the exception of two small rocky islets on the eastern side, 2 miles within the entrance, and a rock awash one mile within the south head, nearly a cable from the western side, the shores are free from danger, and this sound is easier of access and egress than most of the others, in consequence of its greater width, and the winds generally blowing with more steadiness up and down it.

Anchorage cove.—There is good anchorage in 15 fathoms in Anchorage cove on the north shore, at the head of the first reach. With north-west gales a swell sets in, but by hauling over to the north shore and securing to the trees, a vessel will lie in smooth water. The head of this cove is a sandy beach, through which flows a rapid river with 2 feet on its bar at low water. One mile above, the sound trends E.S.E. 3 miles, and then sends off two arms to the south-east and south-west, the latter extending nearly 3 miles, and the former 1¼ miles, with an islet towards the head of each. At the head of the south-east arm is a small cove or basin, and about 200 feet above the level of the sea is an extensive lake, whose superfluous waters run into it by an easy descent down the mountain side, causing a considerable outset in the harbour. The depth of water in these arms varies from 40 to 14 fathoms.

George sound is surrounded by mountains, of the most rugged and precipitous character; a very striking one rises over its western side 3 miles above the entrance to an elevation of 4,775 feet, and a range still more striking and perpendicular, on either side of its head, to nearly 5,000 feet.

BLIGH SOUND is nearly 6 miles N.E. by N. from George sound, the intervening coast being cliffy, slightly indented, and of the same general character as that already described. Two remarkable mountains, 3 miles within the north entrance point, mount Longsight and Table mountain, the former 4,600 feet elevation, will serve to point out the entrance from a long distance seaward in clear weather.

This sound has three reaches, the outer, which is 2 miles in width at its entrance, runs S.E. by E. 3¾ miles, and narrows gradually to Turn-round or entrance point of the second reach, where it is only 2 cables across. The depth of water between the heads is from 30 to 40 fathoms, deepening rapidly within as the channel narrows. From Turn-round point the second reach turns sharply to S.S.W., and runs in that direction 4½ miles, with an average width of half a mile and a depth of 70 to 80 fathoms. On the eastern shore of this reach, three-quarters of a mile from its head, is Amazon cove, a small craft anchorage; above it, the third arm or Bounty haven turns sharp again to E.S.E., carrying a width of 4 cables for 1½ miles to its head, where there is good anchorage in 12 fathoms close to a stony flat, through which flows a considerable stream;* wild-looking lofty mountains rise abruptly from either shore. From the narrow bends of this sound, it would generally be found difficult of access to a sailing vessel.

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* Owing to rapids and scattered fragments of rocks, it was not possible to examine this river beyond 2 miles from its mouth, when the *Acheron's* party came on the fresh footmarks of some natives, who were heard making their escape through the thick underwood:—these people, as far as we could learn, belong to a small isolated and almost unknown tribe, rarely seen even by their own countrymen, by whom they are called wild of the mountains.—From the Notes of Captain Stokes, H.M.S. *Acheron*.

Clio rock, with 9 feet, on which H.M.S. *Clio* struck in February 1870, lies in the second reach of Bligh sound, about half-way between Turn-round and Evening points; it is the outer rock of a cluster surrounded by very deep water, 2½ cables from a bluff point on the eastern shore of the sound; between it and the point are two rocks of similar character, with about 6 feet water over them.

The Clio rock is steep-to, on its south-west side 24 fathoms was found within 20 yards of the rock, and on the north side soundings of from 5 to 9 fathoms were obtained at a distance of 60 yards.

From the rock, Bare cone bears W.S.W.; Turn-round point N. by E. ¾ E.; and Evening point S. ¾ W.

Caution.—Mariners are cautioned that Bligh sound being similar in its features to the other sounds and inlets on the western shore of the Middle island, in having deep soundings close to steep and precipitous shores, and that although the existence of detached outlying rocks is considered to be quite exceptional, still vessels navigating these waters must use due precaution, as similar dangers to the Clio rock may exist, where the present surveys would imply there was the usual deep water.

From Bligh sound to Milford sound, a distance of 16 miles, the coast continues its general trend of N.E. by N., broken by Little and Poison bays, both unfit for anchorage, and which lie at distances of 3 and 8 miles respectively from the former sound, the bold cliffy coast line between them projecting to the north-west about one mile from the general trend. In passing along this shore, at a distance of little more than one mile, no bottom was found with from 70 to 160 fathoms of line.

MILFORD SOUND, the northernmost of the series of inlets now described, though comparatively inconsiderable in extent, yet, in remarkable feature and magnificent scenery, far surpasses them all. The mountains by which it is surrounded are the highest on the coast, with the exception of mount Cook, 120 miles to the north-eastward. Pembroke peak, about 3 miles inland, perpetually snow-capped, rises over its northern side to an elevation of 6,700 feet, and Llawrenny peaks, a very remarkable saddle-backed mountain, attain nearly the same elevation on the southern side; but perhaps the most striking features are the remarkable shaped Mitre, rising abruptly to a height of 5,560 feet immediately over the south side of the sound; and a dome-shaped mountain on the opposite shore, nearly bare of vegetation, which, from its peculiar colour, resembles a huge mountain of metal. These Alpine features and its narrow entrance, apparently still more contracted by the stupendous cliffs which rise perpendicular as a wall from the water's edge to a height of several thousand feet, invest Milford sound with a character of solemnity and grandeur which description can barely realise.

From seaward, the entrance makes as a bay, of which St. Ann's is the south point, and Yates point the northern; they are 5 miles apart in a N. ¼ E. direction; near St. Ann's point is a remarkable jib-shaped white stripe.

Brig rock, 10 feet above water, lies three-quarters of a mile outside the line of the entrance points, and bears N. by W. distant 3 miles from St. Ann's; it is 1¾ miles from the shore with a reef of rocks encircling it for a distance of 2 cables.*

Anita bay.†—St. Ann's point is low and rocky; Fox point, with a small islet lying close to, lies half a mile south-east of it, and immediately round it, is Anita bay, where convenient anchorage will be found in 12 to 18 fathoms, with the small islet bearing N.N.E. about a cable distant. Here a vessel will be sheltered from north-west winds, but with winds from north a swell rolls round the point; by anchoring half a cable off shore, and hauling close in with hawsers fast to the trees, H.M.S. *Acheron* found considerable shelter.

From Anita bay the sound runs up funnel-shaped S.E. ½ E. 1½ miles, when the narrow entrance is reached, it here barely exceeds one-quarter of a mile in width, towering perpendicular cliffs rise on either side, the soundings in mid-channel being 60 fathoms; the sound then trends in an easterly and S.E. ½ E. direction for 6½ miles between stupendous cliffy walls, the widths varying from one-third to three-quarters of a mile. A cable from the highest cliffs on the north shore, near a large waterfall, 214 fathoms mud was obtained; the general depth of water must be very great, as no other soundings could be gained with 180 fathoms of line, except close to the head of the sound. Four miles above the entrance, on the north shore, is Harrison cove, a confined and deep water anchorage, with a steep and winding valley running down to it from Pembroke peak.

Freshwater basin.‡—The head of Milford sound terminates in two coves or basins, separated by a low tongue of wooded land fronted by a steep-to tidal boulder bank. In the eastern of these coves (Freshwater basin) H.M.S. *Acheron* moored in 12 fathoms; this basin is only 100 yards wide at its entrance, with a bar of 3½ fathoms at low water, opening out within to the width of 1½ cables; a magnificent waterfall (Bowen falls) of 700 feet close to the entrance, serves as a guide to it.§ The western cove is larger, with a greater depth of water inside, but its entrance is shallower.

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* Captain Fairchild observes "that the rock lies 1¼ miles from the shore, with some dangerous rocks extending half a mile to the westward of it, which only break in bad weather."

† *See* plan on Admiralty coast chart, Foveaux strait to Awarua river, Sheet XII., No. 2,589.

‡ *See* plan of Freshwater basin, on Admiralty coast chart, Sheet XII., No. 2,589.

§ "The available space for anchorage is decidedly less (1874) than existed at the time of the Survey, in 1851, and the entrance is shoaler, 3½ fathoms at half-tide being the greatest depth in the channel. It is, however, the best anchorage to be obtained in this sound." Captain Simpson, R.N., H.M.S. *Blanche*, 1874.

TIDES.—It is high water, full and change, in Freshwater basin at 9h. 15m.; springs rise 8 feet, and neaps 6 feet.

COAST NORTHWARD of MILFORD SOUND.—From Milford sound to Yates point, a distance of 5 miles in a N. by W. direction, the high wooded slopes are fronted by a succession of sandy or shingle bays, with straggling rocks extending some distance off the points. The channel within Brig rock has not been examined; vessels are therefore recommended to pass outside ; a depth of 20 fathoms, sand and gravel bottom, will be found half a mile from it. The coast between Milford sound and Cascade point (about 40 miles to the northward) should be approached with great care.

From Yates point the coast trends N. by E. ½ E. 15 miles to Awarua point ; at 2 miles northward of Yates point and half a mile from the shore, is a patch of detached rocks; and again to the northward are three deep sandy bays, named Kaipo, Martin, and Big bays.

MARTIN BAY.—The Kaduku or Hollyford river, flowing out of Lake Kakapo or McKerrow, runs into Martin bay (the middle of the three mentioned), and is navigable for small vessels into the lake, and as there is a perfectly easy pass of only 1,400 feet above the sea between this and the great lake Wakatipa (the north-western extreme of the Otago gold-fields), this may become a haven of importance, as it is said to be capable of much improvement.*

BIG BAY.—Between the north point of Martin bay and Awarua point is Big bay, some 2 or 3 miles across, and about 2 miles in depth. The Awarua river flows into the northern corner of the bay.

Danger.—A reef of rocks is reported to extend from Awarua point, (the north point of Big bay) in a westerly direction for a distance of 1½ miles.

The coast from Awarua point trends N.N.E. ½ E. 22 miles to Cascade point, and is apparently free from dangers, excepting the Seal rocks, which extend a short distance from the shore about midway between the two points; and a small rocky islet, 3 miles southward of

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* The discovery of gold on the western shores of the Middle island has added much importance to the anchorages along that coast. The town of Hokitika, it is stated, numbers about 7,000 people, Greymouth about 3,000, and the whole population of the West coast is at present estimated at from 40,000 to 50,000 colonists. In 1850 not a single European resided on the whole line of coast.—Captain C. W. Hope, H.M.S. *Brisk*, 1867.

Cascade point, half a mile off a sandy beach. The land immediately over the coast is steep and of moderate height, but is backed by lofty and rugged mountain ranges; Barn bay, an indentation 6 miles southward of Cascade point, has a remarkable sharp peak rising over its south point, off which are two barn-shaped islets.*

CASCADE POINT is a steep projecting bluff, or rather line of cliffs of moderate height, its face bare and striped by numerous falls of water, which after rains are visible a considerable distance seaward; from this circumstance it has derived its name. Immediately south of these cliffs, and near the coast, is a remarkable dome-shaped mountain, and inland a snow-capped range of great height, with peaks of every variety of shape and ruggedness.

From Cascade point, the projecting point of Jackson bay bears N.E. by E. ½ E. distant 12 miles; this latter (Jackson head) is a remarkable point rising boldly from the sea, with a low neck separating it from higher land. It will be readily recognised approaching from any direction, the coast between it and Cascade point being a sandy bight, and that to the eastward a straight sandy beach 20 miles in extent, with low land stretching a few miles from the beach.

Soundings.—A depth of 48 fathoms, rocky bottom, will be found between Cascade point and Jackson bay at the distance of 4 miles from the land; a heavy swell generally sets on this coast, which renders a cautious approach necessary.

JACKSON BAY is 55 miles northward of Milford sound, and at the south end of the long extent of sandy beach just mentioned. This bay is occasionally visited by whale ships from the facility of gaining or leaving the anchorage, as also for chance supplies of vegetables from the natives; it affords good protection from southerly or westerly winds, and some shelter even as far round as N.N.W., but between that bearing and N.E. is perfectly open. In making for the anchorage, Jackson head must be given a berth of half a mile, as several rocks above water and awash extend nearly that distance from it; on rounding these rocks, a small conical islet, with bushes on the summit, will be seen a short distance from the western shore; the anchorage is in 7 fathoms sand bottom, a short half mile south-east of this islet.

There would be no difficulty in quitting Jackson bay at the commencement of a north-west gale, and it would not then be prudent to remain, as in the event of the wind backing round to the north, a vessel would be exposed to great risk; northerly gales are generally preceded by a swell setting into the bay.* Two miles from the anchorage is a native village, at the mouth of a small stream, where there are small cultivations; there are also larger patches further to the northward a short distance inland; boats can only land on the beach in moderate weather; to the north-east of the river there is always a surf.

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* *See* Admiralty coast chart, Awarua river to Waiau river, Sheet XIII., No. 2,590; scale, $m = 0 \cdot 25$ inches.

With the exception of the roadstead under cape Foulwind in southerly winds, Jackson bay is the northernmost anchorage on this coast, where shelter can be procured for large vessels.

Current.—The current which has been noticed as setting to the southward at the rate of nearly one mile an hour along the south-west coast of the Middle island, is not much felt to the northward of Milford sound, and off Jackson bay may be said to cease. From this cause, as also the more frequent occurrence of southerly and south-west winds, the difficulty experienced by sailing vessels in getting to the northward is considerably lessened.

COAST N.E. OF JACKSON BAY.—From Jackson bay the general trend of the coast is N.E. ½ N. for 88 miles, or as far as Abut head; the first 20 miles is a nearly straight sandy beach, with two small rivers towards its northern end. Three conical wooded hills rise out of the low land which extends for some distance inland from this beach; the southernmost is the highest and most remarkable, it is 2 miles from the beach, and bears East distant 6 miles from the anchorage in Jackson bay.

TAUMAKI, or OPEN BAY ISLETS, are a small rocky group lying off the coast 3 miles from the sandy beach, bearing from Jackson point N.E. ¼ E., distant 13 miles; they are surrounded by sunken rocks which extend nearly 3 miles south-west, and one mile westward and north-east: vessels should pass outside this group. Three miles westward of them 17 fathoms will be found, increasing to 30 fathoms shortly after passing them to the northward. Several dangerous rocks have been discovered in the neighbourhood of these islands, and as the coasting steamers frequently pass inside of them, caution is required in doing so, until the nature and position of the several dangers have been determined by further examination.

Anchorage.—The anchorage under Open bay islets, as described by Captain Kerley of the *Bruce*, is sheltered from all quarters, and may be safely used by any vessel. It is situated under the east side of the main island, from the northern point of which a reef of rocks runs out some distance towards the mainland, and forms an excellent breakwater when the sea sets heavily on the coast from north and north-east. Another reef to the southward breaks the force of a south and south-west sea. A rapid current ran south past the island whilst the *Bruce* remained there; its rate was estimated at between 3 and 4 miles an hour.*

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* Northerly gales generally commence at N.N.E. with clear weather, veering to north-west, with heavy squalls and thick rain; from this point the gale is most severe, and if disposed to last, will back round again to north. A shift to the south-west is generally preceded by a lull with heavy rain, and at the latter point again blows hard, but the gale is then of short duration, and soon subsides into a moderate breeze, with fine weather.

Gales are not so frequent here in summer, though their directions are much the same; south-west and W.S.W. winds then prevail.

ARNOTT POINT and MOUNT COOK.—Seven miles from the north end of the long sandy beach is Arnott point, the first projecting cliffy headland north of Jackson bay, with a high conical hill over it. The great southern Alps here send their steep spurs down to the coast, and in clear weather the summit of the snow-capped and magnificent mount Cook, distant 45 miles, will be seen rising in two distinct peaks 12,000 and 13,200 feet above the sea, with their base generally enveloped in clouds; this is the highest mountain in New Zealand, and justly bears the great navigator's name; in character and ruggedness of outline it somewhat resembles the Kaikora range on the east side of the island.†

COAST from Arnott point to Abut head.—From Arnott point the coast is cliffy and almost straight for 11 miles to Titihai or Tititira head,‡ with scattered rocks extending off the points about one-third of a mile; the soundings 5 miles from the land vary from 60 to 46 fathoms, sand. On the next 17 miles of coast line are three sandy bays, the projecting bluffs, which separate them from the low land on either side, having the appearance from seaward of islands lying near the coast; the northernmost bay is the most extensive, and has a remarkable range of turreted parapet land near the coast, its north bluff being a conspicuous yellow cliff; mount Cook is only distant 18 miles from this part of the coast. Abreast these sandy bays the off-shore soundings decrease, at the distance of 10 miles, varying from 46 to 33 fathoms dark sand and mud.

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* The information relating to an anchorage under Open bay islets is extracted from the *Lyttelton Times*.

† The earliest recognition, and determination of position and height of this mountain range, are due to the surveys made by Captain Stokes and the officers of H.M.S. *Acheron*, 1851, by whom its name was given in honour of their predecessor.

In the record of proceedings of the Royal Geographical Society for June 1882, it is stated that mount Cook was ascended by the Reverend W. S. Green, who calculated the height to be 12,349 feet.

‡ Titihai head was the farthest point reached by that enterprizing and indefatigable traveller, Mr. Brunner, of the New Zealand Colonial Survey Department, whose remarkable journey in 1846-7, down the Buller river, and along the west coast of the Middle island, undertaken partly with a view to the extension of the Nelson district, is recorded in the Journal of the Royal Geographical Society for 1850, vol. xx. p. 344.

Haast river runs into the sea between Open bay islets and Arnott point—its entrance, according to the survey map of Bowring of Canterbury forwarded to Hydrographer, 1863, is in latitude 43° 51″ S.

BRUCE BAY* lies between Makawiho and Heritanewha points, and in its general features resembles Jackson bay, though smaller. The anchorage is close under the South head off Weldtown, in 3 fathoms water, with hard speckled sand bottom, but apparently good holding ground; and is well sheltered from all southerly winds. The South head is a bold rocky promontory stretching out 1½ miles in a north-west direction, thus forming the shelter; and in the adjoining bay southward, the same headland affords protection from the only winds to which Bruce bay is exposed. The vicinity of Bruce bay to Haast river and the gold diggings in that locality, renders it an important place of shelter. Haast river has a navigable entrance for small vessels.

From the yellow cliffs the coast is a succession of rocky points and bluffs, with occasional sandy beaches between, as far as Abut head, three of these projections are remarkable. Long point or Kohuamarua bluff (9 miles S. by W. ¾ W. from Abut head) tapering to the sea from a lofty spur of the high mountain range inland, terminates in a low cliffy extreme; White head, 2 miles further north, is a bluff point, so named on account of its colour; while Abut head is a strikingly bold headland, abutting on the coast as a spur from the lofty mount Cook. Between the yellow cliffs and this headland, no soundings were obtained with 45 fathoms of line at 6 miles from the shore; 8 miles S. by W. ¼ W. of Abut head is Okarito lagoon.

OKARITO LAGOON, into which the river of the same name empties itself on the eastern side, is situated about 15 miles to the southward of Wanganui river. It is a regular tidal harbour, the sea flowing and ebbing with great velocity; the flood continues to run in one hour after it is high water in the offing.†

The entrance is practicable for vessels of light draught, there being 14 feet over the bar at high-water springs; the present channel runs north-west and south-east, vessels entering should keep well over to the south shore until abreast the North spit, and then stand straight across for the opposite side to avoid the current setting upon a middle shingle bank.

About a quarter of a mile from the entrance the channel is divided by an island into two branches, the northern being navigable for a distance of 1¾ to 2 miles, with from 4 to 6 feet at low water, while the southern arm has the same depth of water to a distance of about one-eighth of a mile.

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* From the authority of Captain C. W. Hope, H.M.S. *Brisk.*

† *See* Admiralty coast chart, Waiau river to cape Foulwind, sheet XIV., No. 2,591; scale, m = 0·25 of an inch.

The holding ground is very bad, and vessels must not trust to their anchors and cables if moored in the tideway.

Signals.—A signal mast has been erected, exhibiting the same code of signals as those in use at the Grey and Hokitika rivers.*

Tides.—It is high water, full and change, at Okarito lagoon at 11h. 40m.; range about 9 feet.

The coast northward of Okarito entrance for a distance of 7 miles, is a low sandy bank covered with coarse grass and flax; whereas about half a mile to the southward, there is a high rocky headland from which foul bottom apparently extends some distance in a north-westerly direction.

COAST from ABUT HEAD to the N.E.—From Abut head to Mutungi-tawau point, bearing N.N.E. ½ E. distant 59 miles, the coast is for the greater part low and sandy, falling a little back from a straight line, and with few remarkable features. The mountain ranges, which are here of moderate elevation, recede from 20 to 30 miles from the coast, and appear intersected by several valleys or passes, through which there is possibly communication with the Canterbury plains; the breadth of the island in these localities is nearly 85 miles.

Cliffy head, bearing N.E. ¼ N., 9 miles from Abut head, is a cliffy projection about 8 miles in extent, the intervening coast is composed of low cliffs, fronted by a sandy beach, through which the river Wanganui runs into the sea, 8 miles from Abut head; a rather remarkable hill or headland, close to the coast, rises over the south bank of this river.

WANGANUI RIVER is 29 miles to the south-west of Hokitika river; the entrance is very narrow, and unsafe for vessels of any description to attempt; the South spit overlaps the mouth and runs for a considerable distance to the northward, where, from the coast being rock-bound, a vessel endeavouring to take the bar, and stranding, would without doubt become a wreck.

Caution.—The coast between Wanganui and Okarito should be approached with caution, as the rocks from the headlands apparently run a considerable distance seaward.

BOLD HEAD [illegible] †.—At 12 miles north-east of Cliffy head is Bold head, as the name implies, a bluff point, standing out from the low coast on each side of it, but being in a recess of the coast, it forms no very conspicuous object from seaward.

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* See [illegible] signals [illegible].

† [illegible] between [illegible] head and Cape Farewell, a distance of [illegible] the New Zealand [illegible] them, a great portion [illegible].

Between Bold head and Matungi-tawau point, a distance of 40 miles, is a nearly straight sandy beach, intersected by several rivers and some smaller streams; the southern of these rivers is Hokitika or Brunner, and Arahura, the former is 17 miles from Bold head; Teremakau is about 8 miles further north, and Grey river (*Mawhera*) is at the north extreme of the beach, 8 miles north of Teremakau point.

HOKITIKA RIVER is navigable for vessels of a light draught of water to the distance of 1½ miles from the entrance, but the bar is so constantly shifting its position that no directions for entering could be depended on, local pilotage alone being reliable. There is anchorage from 2 to 3 miles off its mouth in 8 to 10 fathoms, with good holding ground of dark sand.*

Vessels intending to take the bar, being obliged to anchor to await daylight or high water, should bring up a little to the southward of the port, for although there is a southerly current in the offing, a strong northerly set will often be found within the break on the bar.†

A constant heavy westerly swell rolls in on this portion of the coast; and although the prevailing gales blow from north-west, south-west, and south-east, enabling vessels to lay well off shore and obtain an offing, the masters of vessels should not neglect watching the weather carefully, and in the event of its threatening, put to sea in good time.

The heaviest break of the sea at Hokitika is immediately outside the bar, in 2 fathoms water; the bar is constantly shifting in direction and varying in depth; after a heavy fresh, the stream of the river runs straight out to sea, and during an interval of moderate or fine weather the sea piles up either the northern or southern spit, forming a series of middle banks with channels between, the depths averaging from 12 to 18 inches only at low water.

Anchorage.—The best anchorage off Hokitika is in 15 fathoms, the flag-staff bearing E.S.E., distant 2½ or 3 miles, with a scope of cable of 60 or 70 fathoms; this is in good holding ground, and a vessel may here ride in safety except with westerly winds.

LIGHTS.—On Gaol hill, 1¼ miles northward of the flagstaff, on the north side of Hokitika river entrance, stands a white lighthouse, 18 feet high, from which is exhibited at an elevation of 122 feet above the sea a *fixed* white light, visible in clear weather from a distance of 16 miles.

When a *red* light is exhibited from the North spit flagstaff, even though the beacon lights are shown, it will indicate that the bar is dangerous and should not be attempted.

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* From the authority of Captain C. W. Hope, H.M.S. *Brisk*, and the port officer at Lyttelton.

† For general harbour signals, *see* page 15.

When the channel of Hokitika river entrance runs near or along either the north or south walls, a fixed *green* light will be shown on the end of the wall that the channel approaches nearest; but when the walls are overlapped by the spit, no *green* light will be shown.

Tides.—It is high water, full and change, at Hokitika bar at 9h. 39m.; springs rise 8½ to 9 feet, but this rise is greatly affected by the amount of freshet in the river.

"At the flagstaff, south side of town, a semaphore is used to guide vessels, and to which strangers should pay strict attention.

"Two conical moveable beacons, from 20 to 25 feet high, each surmounted by a red flag, to mark the channel over the bar, are shifted to suit the bar changes.

"For the convenience of steamers at night, a *red* light is shown from the rear beacon, and a white light from the front one when placed on the south spit, these in line lead over the bar in the deepest water. Or, should the bar channel trend southward, and the north beacons be required, each will carry a *red* light to distinguish them from the town lights. Strangers are advised not to use them at night. High water, full and change, at 10h. 20m.; average springs rise 9 feet, and neaps 6 feet. The tides on the coast are influenced by the winds."*

Hokitika, the capital of Westland, had in 1878 a population of 8,984; its imports in 1879 amounted to 67,696*l.*, and exports 211,456*l.* It is essentially a mining town, and steadily increasing in importance.

TEREMAKAU RIVER† is 8 miles southward of Grey river, or nearly midway between Grey and Hokitika rivers. At the present time it empties itself into the sea by two channels, one running northward, which is nearly dry at low water; and the other in a south-west direction, with 5 or 6 feet water in it. The entrance is not so confined as the Grey river, but is not equal to Hokitika; small vessels, drawing 4 or 5 feet water, could cross the bar without incurring greater risk than they would at either of the other rivers.

Tides.—It is high water, full and change, at Teremakau river at 9h. 55m.; springs rise 9 feet.

GREY or MAWHERA RIVER‡ flows through an extensive valley running in an easterly direction about 15 miles, when it divides, one branch taking a northerly and easterly direction towards the centre of the island, the other south-easterly, communicating with the Brunner lakes, whence there is a native pass to the Canterbury plains.

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* Harbour-master of the port.

† This river was explored by Mr. Brunner, in 1847, on the return to Nelson from his second journey down the west coast.

‡ From the authority of Captain C. W. Hope, H.M.S. *Brisk*, and the port officer at ton.

Grey river, like all the other rivers on the west coast, has a bar at the entrance which is constantly shifting, rendering the navigation of vessels entirely dependent on local pilotage. After a heavy fresh, the channel breaks out straight in a westerly direction, when it is safe and easy of access for vessels drawing 8 or 9 feet water; but in the absence of any fresh in the river, the channel makes either to the north or to the south, but usually to the north, running for a short distance nearly parallel with the coast line. At such times the entrance is far more dangerous than that of tika river, because, in crossing the bar, the sea takes the vessel on the beam when in the heaviest break, and unless under command with very small helm, she is in danger of being stranded on the beach before getting in a position to keep away for the entrance of the river, which, although deep, is very narrow.

Light.—On the south side of Grey river entrance, a *fixed* white light is exhibited from a flagstaff standing on the south side of the south training wall, which in clear weather is visible from a distance of 5 miles.

From the flagstaff, tidal signals are shown and the depth of water indicated. It is also necessary that due attention be paid to the semaphore arm.*

Tides.—It is high water, full and change, at Grey river at 10h. 15m.

"**Beacons, &c.**—Two moveable beacons painted red — and surmounted by red flags during the day—are used, when best seen and required, for crossing the bar. The rear beacon will be distinguished by a broad black band across it.

"For the guidance of steamers at night, a *red* light is placed on each beacon, which kept in line lead in the deepest water over the bar.

"**Anchorage.**—Off Grey river, there is anchorage with good holding ground, in 10 to 15 fathoms water, with the flagstaff bearing East or E. by N."†

The town of Greymouth, at the river entrance, whose chief wealth is coal, had in 1878 a population of 10,244. Its imports in 1879 were 105,054*l.*; exports, 223,364*l.*

The soundings on the coast between Abut and Bold heads, at the distance of 15 miles off shore from the former, is 49 fathoms, and at 12 miles from the latter, 25 fathoms dark sand; proceeding northward, from 53 to 22 fathoms will be found 6 miles from the coast until abreast Teremakau river, between which and Grey river, at the same distance from the land, are from 20 to 17 fathoms.

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* For general harbour signals, *see* page 15.

† Harbour-master of the port.

Matungi-tawau point, 4 miles N.W. by N. of Grey river, is a remarkable double bluff, of moderate height, composed of limestone cliffs, with a sandy cove between. From this point the coast trends North with cliffy shores and scattered rocks extending in some parts half a mile from the shore. A range of snowy mountains, the Paparoa mountains 10 miles inland, runs parallel with the coast, extending to cape Foulwind, occasionally attaining elevations exceeding 6,000 feet; nearer the coast line is a lower range, rendered remarkable by the irregular and varying outline of their summits.

Perpendicular point, and Ti-miko cliffs, 16 miles northward of Matungi-tawau point, is a bold projection of the coast rising abruptly from the sea; this and the lower range of mountains with their peculiar jagged outlines just alluded to, render this part of the coast very striking; the latter is probably the Five Fingers range of D'Urville.*

The next projecting point, a saddle-shaped summit, is 9 miles to the northward, the Five Fingers rocks standing about half a mile off the coast, which is here formed of low terrace land. Buckland peak, the highest of the snowy range, 6,500 feet high, is 15 miles eastward of this point.

Robertson point, 5 miles N.N.E. from Five Fingers rocks point, is the termination of the cliffs; a small river (*Waitakari*) runs in just northward of it; here the high land recedes and the country becomes low and thickly wooded, with a sandy coast line extending to cape Foulwind, distant 10 miles.

The soundings at 6 miles from the coast, between Matungi-tawau point and this cape, varies from 30 to 50 fathoms, sand bottom.

CAPE FOULWIND (*Tauranga*) is rendered remarkable by three rocks (the Steeples) which lie off it, and also by the coast turning sharply to the eastward from it. The cape itself is a low cliffy point, well wooded, the land within rising gently to the base of the mountains to the southward. The coast, 2½ miles southward of the cape, is fronted by rocky islets, within which, in the small sandy bay of Tauranga (Penguin bay) the sealing boats land.

Anchorage.—In the bay eastward of cape Foulwind and the Steeples rocks, there is a good anchorage, where vessels may lie sheltered during southerly and south-west winds. Vessels taking shelter in the bay should, with the wind from seaward, get under-way on the ebb tide, as the flood sets towards the Steeples.

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* Voyage autour du Monde, by M. D'Urville, Capitaine de Vaisseau, in the French Corvette *Astrolabe*, 1826–29, vol. ii. pp. 11–12.

LIGHT.—A *revolving* white light, attaining its greatest brilliancy every *half-minute*, is shown from a lighthouse, 53 feet high and painted white, standing on cape Foulwind. The light is elevated 190 feet above the level of high water, and in clear weather should be seen from a distance of 19 miles.

The Steeples are three conical rocks, visible at a distance of 10 or 12 miles from a vessel's deck, and show prominently from the southward; they occupy a space of 1¼ miles, and bear N. ½ W., the northern extreme being distant 2 miles from the cape. Several smaller rocks awash are scattered within and about them; the narrow channel between them and the cape is rocky, and only fit for boats.

COAST from CAPE FOULWIND to ROCKS POINT.—From cape Foulwind the coast recedes to the eastward, and forms an extensive bight of which Rocks point is the northern limit; this point bears from the cape N. by E. ¼ E., distant 55 miles, the depth of the bight from a straight line between the two points being 15 miles.*

Falcon rock.—With reference to the existence of a sunken rock, midway between the Steeples off cape Foulwind and the entrance of Buller river, which rock was reported by H.M.S. *Falcon* in 1868 on the authority of the (then) harbour-master at Hokitika,—the following information has been received from the Secretary of Customs at Wellington:—

Falcon rock was searched for in vain by the harbour-master of Westport, Buller river, in the Local Government steam-vessel *Luna*, in November 1873, under favorable conditions of wind, weather, and tide. The vessel steamed three times in a direct line between the northern Steeple and the entrance of Buller river, and immediately over and twice round the reported locality of the rock, yet there were no signs of broken or shallow water, and the shoalest cast obtained at low-water springs was 4 fathoms. It is therefore considered that Falcon rock does not exist in the position formerly given; and the search of the *Luna* pointed to the conclusion, that the rock seen was probably one of the known outlying dangers a few hundred yards E. by N. from the northern Steeple.

It is important that all craft trading to the West coast rivers should be provided with good hawsers and a spare anchor.

BULLER RIVER (KAWATIRI).† — The bar entrance of this river bears E.N.E. distant 6 miles from cape Foulwind. It is one of the largest rivers in New Zealand, and has its source in the lakes Rotuaro and Rotuiti, 40 miles south-westward of Nelson. In its course to the sea it receives the accession of several smaller streams, and becomes a river of considerable magnitude, varying in width from a quarter to one-third of a mile; it is subject, however, to very heavy freshes from the mountain torrents, and rises with great rapidity, frequently between rocky gorges and cliffs so perpendicular as to be in places inaccessible. From these causes, and the barrenness of the country through which it flows, it will probably never become of any great importance as a navigable river. The valley of the Buller forms an extensive gap between the high mountains which bound it on either side, running in a south-easterly direction several miles, and is remarkable from seaward. These snowy mountain ranges extend parallel with the coast, at varying distances of 3 to 4 leagues, nearly as far as cape Farewell.

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* *See* Admiralty coast chart, cape Foulwind to D'Urville island, sheet VII., No. 2,616; scale, *m* = 0·25 of an inch.

† The Buller river was explored by Messrs. Brunner and Heaphy in 1846-7.

The Buller river is described as being the most easily navigable of all the numerous streams on the West coast, having the advantage of being sheltered from the prevailing south-westerly swell by cape Foulwind and the Steeples rocks. A large township, Westport, has been formed at its mouth.

Directions.—The bar at the entrance of this river lies E. ¾ N. 5¼ miles from the outer or northern Steeple rock. Vessels bound for the river should be guided by the signals made at the flagstaff, and in crossing the bar keep the flagstaff and beacon (on which a red flag is hoisted when the tide serves) in line, paying attention to the semaphore arm, as a strong current at times sets across the entrance, and the bar is liable to shift.

By night a *fixed* white light (the harbour light), which should be seen 6 miles, is shown from the flagstaff; and, at tide time, a *red* light from the beacon.

NOTE.—The Colonial bar and danger signals are shown from the flagstaff. The pilot only boards vessels inside.*

"During thick or dirty weather, a red flag is shown from the flagstaff in addition to the white balls on the yard, when the bar is considered safe.

"It is high water, full and change, on the bar at 10h. 25m.; springs rise 9½ feet, and neaps 5½ feet. At high-water springs, the average depth of water on the bar is nearly 13 feet; at neaps nearly 11 feet. The maximum rise from extraordinary causes is one foot higher."†

The population of Westport in 1879 was about 1,000.

The coast from Buller river, which is low and wooded, fronted by a narrow strip of sandy beach, and intersected by several small streams, trends N.E. ¾ N. 23 miles to Mokihinui river; whence the sandy beach is succeeded by a remarkable line of cliffs, which extend N. by E.

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* For general harbour signals, *see* page 15.

† Harbour-master of the port.

¼ E. 9 miles to Wanganui river. Towards their northern extreme are two very conspicuous white patches, visible a long distance from seaward.

Wanganui river, in the extreme depth of the bight, runs into the sea 2½ miles northward of these white cliffs, at the commencement of a sandy beach, which runs in a straight line N.N.W. for 15 miles, intersected by three small rivers, Mahana, Karamea, and Parara, near its central part; and a fourth, the Kohaihai, at its northern extreme. Near the latter river the cliffs again occur, and the coast, which now trends N. by W. ¼ W. 11 miles to Rocks point, is indented by numerous small sandy bays with rocky projections between.

"The entrance of Wanganui river is well marked by the northern extremity of the high land which forms its South head, as also by the white bluffs. The bar, well sheltered from the south-west by a long reef which extends from the South head westward, is straight with 11 to 13 feet over it at high-water springs. The river is navigable, for vessels drawing 6 feet, 2 miles from the entrance."*

The Heaphy, or Wakapoai river, whose entrance between two high bluffs sloping to the sea is remarkable, lies 4 miles to the southward of Rocks point.

Soundings.—The depth of water across the entrance of this great bight, from cape Foulwind to abreast the two white bluffs in its depth, is from 30 to 40 fathoms; it then deepens, and at the distance of 5 miles from the cliffy shore, between Kohaihai river and Rocks point, no soundings were obtained at depths of 50 to 65 fathoms.

ROCKS POINT, which received its name from the numerous scattered rocks extending about half a mile from the shore in its neighbourhood, is a bold projection, from which the coast rounds away about N.N.E. towards cape Farewell, distant 40 miles.

Kiourangi point, with a reef extending from it about half a mile to the south-west, is 11 miles N. by E. ½ E. of Rocks point, and has on its northern face a remarkable white stripe caused by a landslip; this is a good sea-mark, and visible from a long distance. A sandy beach now extends north-eastward 12 miles, interrupted by an occasional cliffy projection. Towards the north-east extreme of this beach, a white patch of sand will be observed, just within high-water mark; this patch, from the southward, will denote the approach to Wanganui inlet, its entrance being 8 miles N.E. by N. with some cliffy points intervening.

Stewart breaker (*Kiourangi shoal*), lying off Kiourangi point, consists of rocky ground, and in extent is three-quarters of a mile long and half a mile broad, having near its southern end a depth of 3¼ fathoms.

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* Wellington Almanac, 1879.

From the shoal part, Kiourangi point bears S.S.E. ¾ E. distant 4½ miles.

NOTE.—In heavy weather this rock should be approached cautiously, but the passage in-shore of it is clear.

WANGANUI INLET.—The entrance shows distinctly from seaward; the points are somewhat remarkable, being high and sloping gradually to the sea, with more elevated land behind. The south head, after sloping, rises again in a cone from the water's edge, and presents a yellowish cliffy projection. Mount Burnett, or Knuckle hill, with its double summit, which is so conspicuous an object in Massacre bay, bears E.S.E. distant 6 miles from the entrance.

The bar, which stretches across from the heads, has 6 feet at low water, and may be crossed at high water by vessels of 10 to 12 feet draught, the deepest channel being close along the southern shore; when inside the water deepens to 3 and 4 fathoms. The inlet, after running in a S.E. by S. direction for little more than one mile, separates into two arms, taking a north-east and south-west direction or parallel with the coast; the north-east arm is shallow, and almost dries at low water. There is anchorage in 4 fathoms one mile within the entrance close on the southern shore; to enter, moderate weather and a leading wind is necessary; south-west winds blow down the southern arm, and generally right out of the harbour.

The bar has not been closely examined, but vessels of the draught before mentioned have crossed it.

TIDES.—It is high water, full and change, at Wanganui inlet at 9h. 20m.; springs rise 6 to 7 feet.

COAST to CAPE FAREWELL.—From Wanganui inlet the coast trends N.E. ½ N. to cape Farewell, distant 8 miles.

Curious cliff, 3½ miles from cape Farewell, is a remarkable piece of table-land, its northern end having fallen away by a landslip: close to the shore, in front of it, is a small perforated rock, Archway islet; several scattered rocks lie off the adjacent coast, apparently fragments broken from the cliffs.

From the southward, the land about cape Farewell has a hummocky appearance, and is of moderate height, the extreme falling down in broken cliffs, where it joins Farewell spit. At the proper navigating distance of 3 miles from this coast the soundings range from 36 to 40 fathoms.

When cape Farewell bears South about 3 miles distant, an E. by N. ½ N. course leads nearly 4 miles outside Farewell spit, in from 39 to 34 fathoms, fine gray sand; the high sand mound, near the centre of the spit, will be seen in passing at this distance, as will also the lighthouse, and from aloft, the bushes on its eastern high-water extreme. For description of light, *see* page 197.

NOTE.—It is necessary to observe that south-west winds on this part of the coast generally veer to the westward, and draw into Cook strait after passing cape Farewell.

The marks for clearing the end of Farewell spit, have been already given in the portion of this work which treats of that locality, pages 196 to 200.

TIDES.—On the outer coast of cape Farewell it is high water, full and change, at 9h. 0m.; the flood stream commences at 6h. 0m., and runs to the south-west, parallel with the coast as far as Wanganui inlet, at the rate of from half to 2 knots.

CHAPTER X.

WINDS, WEATHER, AND METEOROLOGY.*

The climate of the shores of New Zealand, it must be admitted, is stormy and boisterous, although its character in this respect, having been derived principally from the reports of vessels which have visited the settlements in Cook strait, where gales of wind are certainly more prevalent than in most other parts, has doubtless been exaggerated. Embracing, however, as these islands do, so considerable an extent of coast line extending over 800 miles of latitude, with its varied configurations of lofty mountain ranges, extensive plains, and forest tracts, there must necessarily exist, irrespective of local influence, great varieties of wind and weather.

It is accordingly observed that the north and north-eastern coasts of the North island are most exempt from heavy gales, that the eastern and southern coasts are subject to south-east gales, to which, from the scarcity of harbours, ships are much exposed; that Cook and Foveaux straits are visited by frequent and sometimes furious gales from north-west and south-east, while the prevailing winds on the entire western coasts are from north-west to south-west.

In order, however, to offer the seamen the results of the increasing experience derived from the observations of recent navigators and settlers on the coast, it is proposed to divide the islands into districts for a more detailed description, as follows:—

1. From the North cape to the East cape of North island.
2. From East cape to Cook strait.
3. Cook strait.
4. North island.—West coast.
5. Middle island.—East coast.
6. Foveaux strait and South island.
7. Middle island.—West coast.

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* The information contained in this chapter is derived from various sources, collected during the surveys made in H.M. ships *Acheron* and *Pandora*, but especially from a paper on the Meteorology of New Zealand, by Captain B. Drury, R.N., published by the Meteorological Department of the Board of Trade, 1856. This officer, in discussing four years' observations made on board H.M.S. *Pandora*, as also some valuable contemporaneous ones, thus remarks:—

"In some measure they show how uncertainly the ordinary winds of one portion of these islands affect other parts, and yet, if the gale is extraordinary (or an unusual one), how generally the effects are felt.

"It is a matter of interest to trace the extent of the almost rotary storm, the north-east wind, which commences at East, and frequently after suddenly changing from north-east to north-west and south-west, ends within a few points of where it commenced. This is more observable at sea than in the vicinity of the land, where it is an expanded rotary gale, and therefore has not the dire effects of a hurricane. Its prognostics are so certain, and commence so gradually, that the anticipated changes can be made subservient to effecting a passage.

"This north-east gale appears to be common to the southern regions from Bass strait eastward to Tierra del Fuego. Descriptions of it at the latter place do not materially differ from what is observed here, except that here they are more decided in the spring and summer than in the winter."

1. NORTH ISLAND.—FROM THE NORTH CAPE TO THE EAST CAPE.

North Cape to Mercury Bay.

During the summer months, from October to March, the north-east or regular sea breeze is constant on the eastern coast of the North island between the North cape and Mercury bay; it sets in about 10 a.m., and gradually dies away towards sunset, when it is succeeded by the westerly or land wind. Should the sea breeze, however, continue after sunset and the sky become cloudy, it will generally increase to a fresh gale accompanied with heavy rain lasting for several hours, when the wind will suddenly shift to the westward and the weather become fine.

These regular land and sea breezes cannot be depended on during the winter months, and the general wind seems to be from north-west to south-west; a North wind with cloudy weather will usually terminate in a gale accompanied with rain, though of short duration.

North-west winds generally blow strong with heavy rain, and seldom last more than twenty-four hours; the general shift follows the course of the sun. With the wind at West the weather is unsettled and squally, but immediately it veers to W.S.W. and south-west, which it almost invariably does, fine settled weather may be expected to continue for several days.

A strong easterly or south-east gale may be looked for about once in six weeks; it generally occurs about the time of the moon's full or change, and is accompanied by rain and thick weather, lasting from two to three days; this wind is preceded by a high barometer, and generally veers round by the northward to south-west.

There is likewise a south-east wind exceedingly cold, with a clear sky and fine settled weather, which frequently continues for several days, terminating in a calm, or shifting to south-west. Westerly gales generally die away at sunset within a short distance of the shore; their continuance is indicated by a sensible fall in the barometer.

Mercury Bay to East Cape.

Between Mercury bay and the East cape the summer breezes are from the westward, dying away at night in and near the shore, but not in the bay; a north-east gale may be expected once a month, prevailing from March to July. South-east winds are common near the East cape, sometimes lasting for several days, and often very strong, but seldom blowing beyond the Mercury islands. There is also a strong south-west gale, which is dangerous in the roadsteads between cape Runaway and the East cape; it is preceded by rollers and unsteady flaws of wind.

In the bay of Plenty, the sea breeze blows from the westward, and frequently with considerable strength; the south-east wind is more common than in the Hauraki gulf, and freshens rather suddenly; north-east gales, which generally spring from the eastward, come on more gradually and give warning of their approach.

The people residing in sight of White island can foretell weather by the appearance of the steam from its volcano; with West winds the smoke is low, and more of it is seen: the south-east wind, they say, smothers the steam. No doubt the density of the atmosphere affects that vast body of vapour.

2. FROM EAST CAPE TO COOK STRAIT.

Going from East cape to Cook strait a very marked phenomenon frequently takes place on rounding the East cape. The strong westerly wind that drives across the bay carries its line a few miles eastward of the cape, but southward of this the breeze is north-east. Sometimes a vessel may be becalmed for hours between two strong breezes from West and north-east. The configuration of the coast at once accounts for this:—the West wind meets with little obstacle in crossing the narrow and comparative low land north of the ranges forming the southern boundary of the bay of Plenty; at the East cape it meets the lofty Ikaurangi mountain, and the breadth of the country now being considerable, the rarefied air over it induces regular sea breezes from the north-east, succeeded in the evenings by the land wind for a short distance from the shore. An exception is the north-east gale, known on this part of the coast as the black north-easter to distinguish it from the ordinary sea breeze from the same quarter. In winter the sea breeze cannot be depended upon, and south-east and South gales set in very suddenly, and even in summer the south-east winds sometimes last for some days.

In Hawke bay in spring there are fierce westerly winds for days, with a low barometer and variable weather, ending in a cold South wind, blowing hard for a short time, when the ordinary weather returns.

This part of New Zealand has a fine climate; the barometer rises for north-east, south-east, and South winds, and falls for North, north-west, and West winds.

In summer the prevailing winds are north-east with a high barometer, the sea breeze sets in about 10 a.m., and is succeeded by a land wind.

In winter the winds are uncertain; a rapidly falling barometer is the sure sign of a southerly gale, they come on very suddenly and often last three or four days, with rain and thick weather; when they come on with great violence they are of shorter duration. The black north-easters are not frequent in Hawke bay, they occur about twice or thrice a year in January or February, and again in June and July, they give ample warning of their approach; a high barometer falls much less rapidly than before a southerly gale, the sky has a heavy leaden appearance, and the wind comes in gradually with rain, steadily increasing into a gale, this lasts from twelve to twenty-four hours, then moderating to a calm.

Proceeding southward, the ordinary sea breeze from north-east will again be found; north-east gales are far less common than on the north-east coast, while those from south-east, which are so uncommon there, are frequent on both sides of the East cape, lasting several days together. The north-east gales are more frequent in March and April; those from south-east during the winter months, the latter accompanied by showers and lightning to the south-east. North winds, with gloomy weather and rain, frequently precede those from South; and the change from North to South is very sudden.

Before north-east gales the barometer is generally very high; they come on gradually, with a leaden sky, rain follows, and they invariably shift to North and north-west veering to W.S.W., and frequently remaining at the latter quarter for some days; these gales seldom last less than forty-eight hours. It will be found that 3 p.m. is not an uncommon time for change during any gales on this coast.

3. COOK STRAIT.

In Cook strait the prevailing, indeed the almost constant, winds are north-west or south-east; and approaching either entrance with north-east or south-west winds, the former will almost certainly change to south-east, and the latter to north-west; the changes also from north-west to south-east, and the contrary, are common, and frequently very sudden; lightning or a dark bank of clouds rising are pretty certain indications that the wind will come from the quarter in which they appear, but it is not an uncommon circumstance for a vessel running through the strait with a fair wind on opening out either entrance to be taken aback with one from the opposite quarter, with little or no warning. Gales from these quarters are also frequent, and blow with great violence; those from south-east are most frequent during the winter months of May, June, and July; a falling barometer is a certain indication. They come on very suddenly, last often three days, and are generally accompanied by rain and thick weather. North-west gales are most common in spring and summer; they are exceedingly violent, though generally of short duration, and at their strongest raise a high barometer.

These winds are believed to be almost purely local, and their violence is in a great measure due to the configuration of the shores; they do not extend far beyond the line of Strait, and the harbours which indent its shore; in proof of this, the head of Blind bay on the southern side is remarkably exempt from strong winds, and frequently enjoys fine and calm weather while a gale is blowing in Cook strait.

The finest months are April, August, November, and December. Thunder and lightning are unusual.

Table showing the Number of Days the wind blew from any Point of the Compass for each Month in 1868.*

Month.	Wind.											Cloud, 0 to 10.	Morning Observations.					
	Number of Days the wind blew from any Point of the Compass.									Average Daily Velocity in Miles for each Month.	Max. Daily Velocity in Miles in any 24 hours, and Date.		Number of Days.					
	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.				Gales or High Wind.	Thunder.	Snow.	Hail.	Fog.	Earthquake.
										Auckland.								
January -	8	0	4	0	2	1	9	1	0	146·9	—	7·1						
February -	2	2	3	3	1	7	8	3	0	147·6	—	7·3						
March -	2	2	4	2	15	4	1	1	0	147·6	—	7·2						
April -	3	1	0	0	11	9	3	3	0	144·0	—	7·0						
May -	5	1	0	13	0	6	3	0	3	126·7	—	7·2						
June -	0	1	3	3	5	4	6	0	8	126·0	—	6·0						
July -	2	0	0	1	11	6	3	4	4	147·6	—	6·6						
August -	3	1	1	3	10	9	0	0	4	152·6	—	6·5						
September	2	4	7	3	5	3	6	0	0	358·4	907–1st	5·4	2	0	0	1	1	0
October -	4	1	0	0	3	8	9	4	2	421·2	850–2nd	5·7	6	2	0	2	0	1
November	2	4	3	0	3	6	9	0	3	375·8	624–25th	5·3	8	1	0	1	0	0
December	2	0	0	0	4	9	10	4	2	334·6	568–1st	5·4	4	0	0	0	0	0
	37	17	25	28	76	72	67	20	26									
										Wellington.								
January -	13	2	2	2	3	1	0	6	2	128·6	590–14th	6·6	4	0	0	0	0	1
February -	9	2	1	2	3	0	1	7	4	115·5	489–20th	5·7	2	1	0	1	0	1
March -	6	1	1	1	6	0	0	14	2	215·4	455–18th	5·7	7	0	0	0	0	0
April -	7	2	0	0	5	2	1	11	2	195·6	384–4th	5·5	4	0	0	0	0	0
May -	5	3	0	4	2	1	0	6	10	193·0	375–23rd	5·8	1	0	0	0	0	0
June -	9	0	0	3	6	3	0	3	6	206·0	513–6th	7·3	3	0	1	1	1	0
July -	10	0	0	0	4	3	1	5	8	199·0	595–27th	5·5	3	1	0	0	0	1
August -	4	0	0	1	4	8	1	2	11	174·8	375–24th	6·4	1	0	1	0	0	1
September	7	1	4	1	8	1	0	4	4	182·7	385–2nd	5·7	0	0	0	0	0	1
October -	7	2	0	0	5	4	3	8	2	236·3	490–31st	6·3	10	1	0	0	0	2
November	1	6	0	6	0	1	0	16	0	127·0	740-22nd	4·8	6	1	0	1	0	1
December	2	2	1	3	0	2	0	21	0	244·0	480–31st	4·7	10	1	0	0	0	1
	80	21	9	23	46	26	7	103	57				44	5	2	3	1	9

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* New Zealand almanac for the year 1874.

(*continued.*)

Month.	Wind.											Cloud, 0 to 10.	Morning Observations.					
	Number of Days the wind blew from any Point of the Compass.									Average Daily Velocity in Miles for each Month.	Max. Daily Velocity in Miles in any 24 hours, and Date.		Number of Days.					
	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.				Gales or High Wind.	Thunder.	Snow.	Hail.	Fog.	Earthquake.
										New Plymouth.								
January -	5	1	0	1	0	5	5	6	8	199·1	968–3rd	7·1	4	1	0	0	1	1
February -	2	5	0	2	0	5	4	5	6	249·9	884–3rd	7·3	7	4	0	1	1	1
March -	0	2	0	3	0	6	7	2	11	—	—	7·1	3	0	0	0	0	1
April -	2	3	1	3	1	8	7	4	1	261·0	483–30th	6·7	6	6	0	0	0	0
May -	1	1	1	4	2	6	7	4	5	260·0	639–5th	6·4	5	1	0	0	4	1
June -	1	1	3	9	1	1	4	1	9	271·0	894–3rd	6·9	5	0	0	0	2	0
July -	1	3	1	7	5	7	4	3	0	412·5	991–26th	6·1	3	0	0	0	0	0
August -	2	1	2	13	2	11	0	0	0	391·8	885–13th	5·4	6	0	0	1	0	2
September	1	4	1	14	0	3	4	1	2	316·0	746–1st	4·0	4	2	0	0	0	0
October -	3	1	1	3	1	10	6	6	0	312·7	590–16th	7·7	3	3	0	0	5	7
November	1	3	1	1	0	10	5	6	3	235·5	555–25th	7·3	5	3	0	1	1	4
December	1	3	0	0	0	11	9	7	0	300·0	470–6th	6·5	2	0	0	0	2	3
	20	28	11	60	12	83	62	45	45				53	20	0	3	16	20
										Nelson.								
January -	7	8	1	3	1	3	1	7	0	135·0	240–13th	5·0	0	1	0	0	0	0
February -	5	8	0	6	0	6	1	3	0	149·0	286–25th	6·0	2	2	0	1	0	0
March -	1	10	0	1	0	12	0	7	0	130·0	300–20th	4·0	0	0	0	0	0	0
April -	3	7	0	2	0	13	0	5	0	127·0	252–14th	4·4	0	0	0	0	0	0
May -	4	7	0	4	0	9	3	4	0	133·0	270–25th	4·0	0	0	0	0	0	0
June -	4	6	0	6	1	4	2	7	0	98·0	214–12th	6·2	0	0	0	0	0	0
July -	2	3	0	2	1	10	3	10	0	52·7	202–13th	4·2	3	1	0	0	0	1
August -	4	8	0	3	4	8	0	4	0	121·6	337–31st	2·6	0	0	0	0	0	0
September	7	5	0	10	0	5	0	3	0	141·9	380–2nd	3·8	4	0	0	0	0	0
October -	2	6	0	3	0	11	1	8	0	130·6	290–16th	6·1	0	1	0	0	0	1
November	4	9	1	4	0	7	0	5	0	159·4	292–27th	5·2	0	0	0	0	0	0
December	2	7	0	1	0	13	1	7	0	133·0	316–1st	7·0	2	0	0	0	0	0
	45	84	2	45	7	101	12	70	0				9	7	0	1	0	2

The following tables are from observations made at Wellington, Port Nicholson, in 1854:—

TEMPERATURE.

—	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov	Dec.
Minimum	56°	61°	56°	42°	34°	32°	32°	32°	37°	40°	42°	42°
Maximum	83	73	77	62	56	54	55	64	70	74	78	70

BAROMETER (*at Sea-level*).

—	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Minimum	29·32	29·52	29·40	29·39	28·70	28·72	29·20	29·22	29·15	29·07	29·03	29·10
Maximum	29·99	29·99	30·10	30·45	30·61	30·15	30·07	30·33	30·05	30·02	30·33	39·04

4. NORTH ISLAND.—WEST COAST.

In this division the ordinary wind throughout the year is from north-west to south-west, and from W.S.W. it lasts longest. In summer the north-west and south-west winds are both fine. In winter the north-west wind is prevalent, accompanied by rain.

On the south-western coast, when clear of the influence of Cook strait, there are regular land and sea breezes during the summer season, the latter from south-west and light winds off the land during the night. In winter the weather is variable; the spring and fall of the year bring the heaviest gales.

South-west or W.S.W. is the prevailing wind, and south-east is the fine weather quarter on the southern part of this coast—northward of cape Egmont; the north-west which blows directly into the roadstead of New Plymouth, does not often blow home; it gives sufficient warning, backing round from north-east and North, and is generally preceded by a swell.

North-west winds blow very hard for about twelve hours, and then change to W.S.W., afterwards to south-west.

From November to April the weather is fine. In June and July south-east winds prevail. Gales at any season seldom last more than forty-eight hours. Sometimes a north-west swell sets in without the wind blowing home.

The barometer rises for South and East winds, and falls for northerly and north-westerly, which is the rainy quarter.

The proportion of north-west to south-east winds is about seven to four, which may be assumed as also the proportion of south-west winds to all others on the West coast.

On the north-west coast in the neighbourhood of Hokianga river and Kaipara harbour, westerly winds are the most frequent; it blows hardest from north-west to south-west, the heaviest gales from the latter quarter, and in the winter months. Easterly winds are more common in summer, and draw round to the South; they are looked for at the time of the new moon, and generally last three days. Most rain falls in July, August, and September; fogs prevail in October and November, but seldom last after 8 a.m.

5. MIDDLE ISLAND.—EAST COAST.

On the eastern coast of the Middle island, between cape Campbell and Foveaux strait, the north-east sea breeze may be looked for during the summer months; and within a short distance of the coast a wind off the land during night, but not with the same degree of regularity as they are found on the eastern coast of the North island.

Strong winds from north-west and south-west are frequent, and south-east gales are not uncommon; the latter blow heavily, bring thick dirty weather and rain, and continue between two and three days.

About Lyttelton, nearly central in this district, we find the summer sea breezes blow from the north-east, with hazy weather, occasionally changing to north-west for two or three days. The summer sea breeze dies away at sunset, and is succeeded by a light south-west wind, springing up about midnight, which lasts until 9 a.m.

In winter the prevailing winds are south-east at sea, but at Lyttelton and Canterbury the wind is south-west, while at sea it is south-east. In spring and autumn the winds are variable from north-east for two or three days, with very fine weather; then light winds for a day, shifting to north-west, blowing a gale from twelve to forty-eight hours; then a sudden shift to south-west, strong wind and rain for three days, when it comes round again to north-east along shore.

Fortunately it seldom blows strong from East, but even light winds from that quarter produce a heavy swell in port Lyttelton. This wind is accompanied by fog and misty rain. The violent south-west wind in this harbour (off the land) is accompanied with more danger to shipping than any wind that has blown in. In December H.M.S. *Pandora* experienced a south-easter between Canterbury and Otago: it fell calm for an hour, when the S.S.E. wind came up suddenly, and with little warning it veered to S.S.W. This south-west wind corresponds to the south-eastern of Cook strait.

It is very necessary to be aware of the prognostics of the sudden changes along this coast, especially the north-wester, which comes on at once to blow furiously; the most unmistakeable sign is a remarkable transparency of the atmosphere, which is very clear indeed.

The north-west wind of this district resembles the sirocco of the Mediterranean: it comes on suddenly, and changes the temperature in a few minutes from 12 to 20 degrees. This change in the temperature, perhaps, arises from the rapid melting of snow in crossing the southern Alps, or from crossing heated plains.

The south-west wind is preceded by heavy hard-edged dark cumuli in that quarter. At sea this is probably S.S.E.

Again, the mountains are clouded in a south-easter, and partially in a south-wester, while all distant objects, including the Kaikoras, are distinct, with a fine blue tint, on the approach of the north-west wind. The finest months are December, January, February, and March. Rains and gales are chiefly in June, July, and August. The rainy quarter is north-west to south-west. The hot north-wester in summer frequently terminates in wet: there is also a wet and dry south-wester. In autumn or winter the barometer rises very high, with light East winds, producing fogs and much rain lasting ten or fourteen days.

The barometer is very variable on this coast; its fluctuations amount almost to a puzzle on shore. It is supposed the lofty mountains must have some share in producing local pressure, as the mercury is frequently moving, though no apparent atmospheric disturbance takes place.* The following remarks are specially applicable at sea:—In winter the mercury falls previously to a S.S.E. or south-west gale, but immediately before commencing it rises, and when at its greatest height the gale blows strongest. In winter such a gale brings continuous rain for three days: but in spring and autumn severe squalls, with rain, hail, and sleet, the glass remaining high, and it is succeeded by north-east wind and fine weather. The mercury falls before a north-west gale, especially if followed by a wet south-west wind; the change is often immediate. It is very low when snow falls, although without wind.

At Lyttelton the barometer has been very low for many days without any change; it has been at its highest with very bad weather, and soon after at its lowest with very fine weather. It appears that the cyclone north-easter does not occur above four times a year, then the rain from this quarter is heavy. The greatest fall of rain yet known in twenty-four hours was 2·14 inches in April 1853.

The uncertainty of the weather is shown to be remarkable by the following example:—The rain that fell in,

April, 1852 - - - 3·09 inches.

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* Similar effects have been noticed near Tierra del Fuego.

April, 1853 - - - 9·40 inches.
April, 1854 - - - 1·08 „

The following tables are from observations in 1852, 1853, and 1854, made at Christchurch, as registered between 9 a.m. and 4 p.m., 20 feet above sea-level:—

TEMPERATURE.

—	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Minimum	52°	52°	52°	45°	37°	32°	31°	33°	39°	44°	46°	51°
Maximum	89	87	83	79	69	61	61	61	67	76	77	82

BAROMETER.

—	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Minimum	29·15	29·26	29·07	29·50	29·02	29·11	29·07	29·19	29·14	29·26	29·25	29·15
Maximum	30·18	30·09	30·31	30·50	30·33	30·43	30·42	30·50	30·21	30·26	30·27	30·14

WINDS.

—	N.N.E. to N.N.W.	N.W. to W.	S.W.	S.E. to N.E.	Calm or Variable.	—
1852 -	4	20	112	119	110	—
1853 -	6	21	115	120	103	—
1854 -	5	27	99	151	83	—

At Otago no register appears to have been kept previous to 1854; the following information regarding the weather there is from the intelligent pilot, who resided sixteen years near the heads.

North winds are rare: the ordinary sea breeze is north-east; it seldom blows from the East: south-east winds are accompanied by thick hazy weather, but seldom blow home.

South winds do not blow strongly, unless they veer to S.S.W. and south-west.

The winds off the land are the strongest, and W.N.W. winds blow the hardest, the latter being at times a hot wind. The squalls from this quarter are heavy.

The heaviest gales are in November, often with large hailstones.

The dirtiest weather is in June and July. January is the hottest, and July the coldest month. Snow falls and lies on the ground for two or three days in June, July, and August. South to south-east is the rainy quarter.

The pilot considered that there are about 30 days in the year when it would not be prudent to cross the bar because of the swell, which is worse in attempting to leave. He states that the year 1853 was a peculiarly dry season. It is curious that in that year there should have fallen at Canterbury nearly double the annual average amount of rain, and that in all other parts of New Zealand it was remarkably dry.

The effects on the barometer may be generally assumed as similar to those of Canterbury, allowing for 2½° higher latitude. At Otago there is much more fog.

6.—FOVEAUX STRAIT AND SOUTH ISLAND.

Foveaux strait and the coasts of Stewart island are without doubt the most boisterous localities in New Zealand; heavy gales from north-west to south-west are the prevailing winds, and seem to blow without regard to seasons, at all times of the year, occasionally continuing for weeks without intermission. North-west winds are the most frequent in Foveaux strait, which seldom last less than four or five days, and often bring rain and thick dirty weather; thunder, which is not of common occurrence in New Zealand, is said to indicate that the gale will be of unusually long duration; the barometer falls on the approach of this wind, though it often continues to blow hard after the mercury has risen; on these occasions, however, it generally veers to south-west, and the weather clears. With a strong north-west or westerly wind in Foveaux strait, it is often from south-west on the eastern coast of Stewart island, and on the western coast of that island the north-west wind becomes N.N.W.

A strong south-east wind may be looked for about once in six weeks in the summer months, and perhaps twice in that period during June, July, August, and September, and generally occurs about the full or change of the moon; the barometer rises before one of these winds, and they often blow with great strength, bringing thick weather with drizzling rain; a heavy bank of clouds rising to the south-east, with rain, and the hills clothed with a white mist nearly to the horizon, are considered as certain indications.

Before a south-east gale, also, the groups of islands between Ruapuke and Stewart island appear much raised by refraction, but on going westward, should Solander island appear distorted from the same cause, the westerly wind will prevail over the easterly: a casual north-east or easterly wind with fine weather in the eastern entrance of the strait almost certainly turns to north-west before reaching the western entrance; the only wind which can be depended on to carry a vessel through is a strong south-easter.

The worst weather is said to occur in Foveaux strait in July.

During very fine weather the ordinary sea breeze of the East coast prevails as far south as the Traps rocks, but this must not often be looked for, and it is almost invariably met there by the N.N.W. wind of the West coast.

7. MIDDLE ISLAND.—WEST COAST.

The north-west or N.N.W. wind is very constant on the south-west coast of the Middle island, until sufficiently far to the northward to be out of the influence of Foveaux strait, and the endeavour to round the south-west extreme from this cause, as well as a southerly current which prevails, is extremely tedious for a sailing vessel. When to the northward of West cape the difficulty is in a great measure overcome, as there is a port under the lee, and moreover south-west winds are of more common occurrence; it frequently, however, blows hard from both quarters. A falling barometer indicates a north-west wind, which brings rain and thick weather, while with that from south-west it is generally fine and clear.

Unless blowing very hard in the offing, the wind generally falls light or dies away within one or two miles of the high precipitous coast between the south-west extreme of the Middle island and Milford sound, but a strong gale blows home and direct up the inlets; rain is frequent in all the harbours of this coast, and a land wind will be found to draw out of them in the early morning, unless it is blowing strong from the westward outside. North-west gales are less frequent, and intervals of fine weather, accompanied by southerly or south-west winds, and attended with a high barometer, are by no means uncommon.

From Milford sound to the northward the prevailing winds are from north-west to south-west; the former frequently bring rain and thick weather, and as the shore is approached generally veer to the northward. South-west winds are fine and clear; rain is of very frequent occurrence, and often lasts for several days together without intermission.

At the anchorage in Jackson bay it has been observed that nortberly gales generally commence at N.N.E., with clear weather, veering to north-west with heavy squalls and thick rain ; from this point the gale is most severe, and if disposed to last, will back round again to North. A shift to the south-west is generally preceded by a lull with heavy rain, and at the latter point again blows hard, but the gale is then of short duration, and soon subsides into a moderate breeze, with fine weather.

Gales are not so frequent here in summer, though their directions are much the same ; south-west and W.S.W. winds then prevail.

On rounding cape Farewell with South or south-west winds, they almost invariably draw to the westward and north-west, and follow a vessel through Cook strait.

TABLE showing RAINFALL in North and Middle Islands, New Zealand.*

Place.	Mean Annual Rain-fall.	Averages of Rainfall for the different Seasons of the Year, with the Mean Number of Days of Rain.									
		Spring. Septr., Octr., Novr.		Summer. Decr., Jany., Feby.		Autumn. March, April, May.		Winter. June, July, August.		Mean No. of Days on which Rain falls annually.	Period of observation.
	Inches.	Inches.	Days.	Inches.	Days.	Inches.	Days.	Inches.	Days.		Years.
Auckland -	44·622	11·031	45	8·378	27	11·009	37	14·265	56	177	15
Taranaki -	58·584	17·088	42	10·974	27	14·133	30	17·199	47	146	12
Wellington -	50·091	12·148	35	9·685	27	12·666	33	16·021	46	146	10
Mean for North island.	51·119	13·422	40	9·679	27	12·602	33	15·828	49	156	
Nelson -	54·721	16·746	28	13·211	17	8·795	19	14·550	23	92	16
*Christchurch	31·636	5·145	24	7·266	23	8·022	26	13·193	35	113	11
Dunedin -	32·886	8·129	44	9·428	41	7·943	38	7·253	46	178	15
Mean for Middle island.	39·747	10·006	32	9·968	27	8·253	27	11·665	31	127	
	51·119	13·422	40	9·679	27	12·602	33	15·828	49	156	
Mean for both	45·433	11·714	36	9·823	27	10·427	30	13·746	35	141	

* The monthly averages for the amount of rain, and the number of days of rainfall, are only for 8 years, while the mean annual fall, and number of days, are for 11 years.

MEAN TEMPERATURE of AIR in Shade recorded at the Chief Towns in the North and Middle Islands, New Zealand.

Places: North island.	Mean Annual Temperature.	Ditto for Spring. Septr., Octr., Novr.	Ditto for Summer. Decr., Jany., Feby.	Ditto for Autumn. March, April, May.	Ditto for Winter. June, July, August.	Period of Observation.
	°	°	°	°	°	Years.
Auckland -	60·3	58·8	68·6	62·3	53·3	15
Taranaki -	56·8	55·9	64·2	57·4	49·5	12
Wellington -	55·7	54·6	63·6	56·7	47·9	10
Places: Middle island.						
Nelson -	55·0	53·3	62·5	56·4	46·5	16
Christchurch -	55·1	55·5	61·4	55·9	44·5	11
Dunedin -	50·7	50·0	57·4	51·6	47·0	15
Mean -	55·6	54·6	62·9	56·7	48·1	—

From the annexed table it will be observed that in the North island the mean annual temperature for Auckland is the highest (60°·3) and that of Taranaki (56°·8) the next, while Wellington is the lowest (55·7). In the Middle island Christchurch (55·1) and Nelson show the highest mean annual temperature, Dunedin (50·7) very much lower. January and February, corresponding with July and August in England, are the two warmest months in New Zealand; and July and August, corresponding to January and February in England, the two coldest, excepting at Nelson and Wellington, at which places the mean readings are lowest in June and July. The climate of London is 7°·2 colder than that of the North island, and 3°·8 colder than the Middle island of New Zealand; and the difference between the mean annual temperature of the whole of New Zealand and that of London is 5°·7; the former being 55°·7, the latter 50°.

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* From Remark book of Staff Commander W. H. Sharp, H.M.S. *Liverpool*, 1870.

The following are the means for the two warmest and the two coldest months in the year, in the several localities, with their differences:—

Auckland.	Taranaki.	Wellington.	Nelson.	Christchurch.	Dunedin.
69·6 53·1	64·7 49·3	64·6 47·8	63·6 45·9	65·2 44·3	58·0 43·2
16·5	15·4	16·8	17·7	20·9	14·8

From which we find that the average difference between the mean temperature of the warmest and coldest month of the year in New Zealand is 17°. At Rome it is 27°; at Montpellier, 33°; at Milan, 38°; and at Jersey, 22°.

[illegible]

[illegible]

[illegible]

[illegible] ; Chatham islands, [illegible] East.

THE AUCKLAND ISLANDS, a group in the South Pacific Ocean, to the southward of New Zealand, lying between the parallels of about [illegible] S., and the meridians of 165° 55' and 166° 20' E., were discovered, during a whaling voyage, on the 18th August 1806, by Captain Abraham Bristow, in the ship *Ocean*, a vessel belonging to Samuel Enderby, Esq. The discoverer, who named the group after Lord Auckland, again visited the islands in 1807, and then took formal possession of them.*

The group consists of one large and several smaller islands, separated by narrow channels, and extend over a space of about 27 miles in length north and south, by 15 miles in breadth. The land is mountainous, as it ranges from [illegible] feet at Hooker hills in the north to 2,000 feet at Adams island on the south. The eastern side of the main island is deeply indented; the western side is unbroken, having no opening but the narrow separation of Adams island (a channel fit only for small steam vessels), the coast line being backed by hills varying from 600 to 1,500 feet high.

The Auckland islands have been thus described by Dr. Hooker, of H.M.S. *Erebus*, who visited them in 1840 during the Antarctic voyage of Sir James C. Ross.

"Though possessing no mountains rising to the limits of perpetual snow, and few rocks or precipices, the whole land seemed covered with vegetation. A low forest skirts all the shores, succeeded by a broad belt of brushwood, above which, to the summits of the hills, extend grassy slopes. On a closer inspection of the forest, it is found to be composed of a dense thicket of stag's-horned trees, so gnarled and stunted by the violence of the gales, as to afford an excellent shelter for a luxuriant undergrowth of bright green feathery ferns, and several gay flowered herbs."

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* See Admiralty chart, Auckland and Campbell islands, No. 1,214; scale, [illegible]

In connection with the same group, Mr. McCormack, surgeon of H.M.S. *Erebus*, writing in 1840, states :—

" There is no species of land animal with the exception of the domestic pig introduced several years ago, and now in a wild state. The birds are all New Zealand species, from which country these islands have unquestionably been colonised by the feathered tribe. Of land birds there are not more than seven or eight species, and of these the beautiful 'Tooe' bird of New Zealand, and a small olive green species allied to *Meliphagidæ*, are the chief choristers of the woods, which are in many places almost impenetrable, the trees and underwood forming dense thickets."

" The water birds consist of a New Zealand species of duck (*teal*), a mergus (*merganser*), a species of cormorant (*phalarocrocorax*), a snipe, a penguin, and two kinds of gull, the black-backed and small ash-backed, frequenting the bays in great abundance. The albatross (*diomedea exulans*) was breeding in considerable numbers on the tops of the cliffs to the north-west of the harbour (port Ross or Sarah's bosom). Their nest is formed upon a small mound of earth, of withered grass and leaves matted together, above six feet in circumference at the base, and about 18 inches in height; it is the joint labour of the male and female birds."

" Like most of the petrel tribe, the albatross lays only one egg, of pure white, varying in weight from 15 to 21 ounces. In one instance only, out of above 100 nests that were examined, were two eggs found in the same nest. Its greatest enemy is a fierce raptorial gull, very strongly resembling the skud gull, both in its predatory habits and general aspect, and is probably an undescribed species. Several kinds of petrel were breeding in holes underground, and on the sides of the cliffs bounding the bays. A solitary ring-plover was seen, but no specimens obtained."

" The pigs that were left on the island by Captain Bristow in 1807, have become very numerous; their food consists of the *Arabia polaris*, one of the most beautiful and singular of the vegetable productions of the island it inhabits, growing in large orbicular masses on rocks and banks near the sea or amongst the dense and gloomy vegetation of the woods; its copious bright green foliage and large umbels of waxy flowers have a most striking appearance."

From the eminent services rendered to geographical science in the south polar regions, and to further those commercial enterprises in which the Messrs. Enderby for many years had so largely engaged, the group was granted by the Government to them for the head-quarters of a Whale Fishery Company. Mr. Charles Enderby, with an efficient staff, accordingly formed a settlement in the early part of 1850, in port Ross; the company, however, was not successful, and after a few years the enterprise was abandoned.

The following information relating to the means of subsistence in the event of wreck on the shores of these islands has been furnished by Mr. Charles Enderby:—"On the two islands of Auckland and Enderby there are a vast number of pigs. I have seen, when standing on the cliffs of the latter island, as many as one hundred at a time feeding on the rocks beneath; but these were by no means the only pigs on that island, for I have likewise seen as many as six splendid black boars running in the woods of apparently a different breed from those first mentioned; but although Enderby island is only 3 miles in length by one in width, I have never been able to find their hiding place or to capture one of them."

"On the larger island of Auckland pigs are yet more numerous, and are of two descriptions, viz., those feeding on the sea shore, the flesh of which is very unpalatable until kept on vegetable food for two or three months, and those feeding on the hills or in the woods on a plant called by the New Zealanders '*cooper cooper*,' which I presume is that described by Dr. Hooker in his Antarctic voyage as the *Pleurophyllum criniferum* or that to which it is closely allied, the *Pleurophyllum speciosum*, which has leaves two feet in length by one in width, and this he mentions as the plant with the roots on which the pigs feed, and that it is to be found in great abundance in many places on the borders of woods and on the hills. The flesh of these pigs I found excellent."

"I imagine these pigs would be difficult to take, although so numerous, without firearms, unless some means be devised for snaring them. The stalks of the plant on which they feed are covered with silky hairs, which should be scraped off; when cooked these stalks are not unpalatable, something resembling rhubarb, and are commonly eaten by the New Zealanders. Of other vegetables I can say little; there should, however, be the remains of vegetables I planted on Enderby island and other places if not rooted up by the pigs." *

"There are a number of dogs on Auckland island (now in a wild state) lost by the New Zealanders, and these, with the hawks, which are large and numerous, would effectually destroy any fowls or rabbits which might be placed there. When I quitted the settlement in 1853, the dogs were confined to the one island above mentioned, but as the New Zealanders were left on the island for many months after the settlement was broken up, I am unable to say if any of their dogs were left on the other islands. Seals are to be found the greater part of the year in considerable numbers, particularly on the shore and in the woods of the southern harbours, and are easily captured by striking them sharply on the nose; but in May (the pupping season) the females come on shore in vast numbers, and the pups are by no means bad eating."

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* Depôts of provisions have been established by the Colonial Government for the benefit of shipwrecked people at the following places: south side of Erebus cove; sandy bay on Enderby island; Saddle or Norman inlet; and at Carnley harbour; the two former were examined and replenished by the *Cossack*, 1873. Numbers of rabbits were seen on [illegible] but no ducks there or at port Laurie.—Remarks by Nav. Lieut. E. C. D[illegible] H.M.S. *Cossack*, 1873.

"Ducks of three descriptions are common at the Auckland island, one kind of which cannot apparently fly; they are in the greatest abundance in the southern harbours. Small birds are numerous and not difficult to kill with stones or sticks, and are not bad food; amongst them may be mentioned the parson bird and the paroquet. The common shag are numerous and to be found in all parts, but I have particularly noticed them on a point of rocks facing Ocean islet. The mutton birds frequent the island in vast numbers at certain seasons; they are about the size of a pheasant and excellent eating but fat, and obtained at night by lighting a fire, which they approach on the wing, and are knocked down with sticks."

"On Rose island there should now be a great number of rabbits, and wood-hens (probably the *Troglodite* rail) which I placed there. I had rabbits in the first instance on a small piece of detached land between Auckland and Rose island, but they multiplied so rapidly that there was not sufficient food for them. When I left the Aucklands there were a considerable number of cattle on Enderby island, but I have been told that many of them have been killed."

"Of fish there is a great abundance throughout the year, mostly rock cod, which may be caught by hook and line from the shore, generally in places where there is seaweed.* There is a large bed of cockles at the head of Laurie harbour (port Ross), the shells of which are from 1½ to 2 inches in diameter; they are about two inches below the surface at low water, and a dozen of them may be taken up at a time with a spade; other beds of cockles were reported to me as having been found in like positions and equally numerous in several of the southern harbours."

"I may observe that there is a seaweed, which the New Zealanders partly split open and make into a bag, which is capable of holding from seven to ten gallons of water, in which are put a large number of mutton birds that float in their own oil, and which keep for a long time thus prepared. These bags might be inflated, and would bear the weight of a man in the water."

"The climate though boisterous and subject to much rain is healthy, although attempts have been made to prove the contrary; cases of rheumatism occurred as might have been expected, situated as the persons were who accompanied me to those islands, numbering together with New Zealanders and seamen about 300, but no death arising from the climate or from disease contracted on shore occurred in 3½ years whilst I was there.

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* During the visit of H.M.S. *Blanche* to these islands in February 1874, rock cod were caught, but their bodies found to be full of worms; therefore it was presumed that at that time of the year this fish is not in season. The provision depôts above mentioned were visited, and found in good order. Enderby island was overrun with black rabbits.

The temperature is very equable, the snow never lying more than three days on the ground except on the summit of the hills."

"The winds are violent and of long duration; the gales are mostly from the north-west, although I experienced two from the eastward unusually strong." They mostly commence at North with a falling barometer, veer gradually to West and W.S.W., and at times blow most violently; when the barometer begins to rise the gale ceases at South or S.S.E.

Captain Benjamin Morrell, writing in 1830, states:—"The climate is mild, temperate, and salubrious. In the month of July, the dead of winter, the weather is mild as respects cold, the thermometer never being lower than 38° in the valleys, and the trees at the same time retain their verdure as if it was midsummer. In December and January the thermometer was 78°."

The whaling season is in April and May.

BRISTOW ROCK.—We commence the description of the coasts and harbours of these islands by describing Bristow rock, an off-lying danger northward of Enderby island, directly in the track of vessels rounding the north end of the group. Mr. Chas. J. Polkinghorne, Master, H.M.S. *Fantome*, 1852, who approached this danger in a large whale boat during a heavy sea, says:—"I could not obtain soundings or get nearer to it than half a cable, as the sea was breaking and thrown up from the centre like a pillar or spout of a whale to a height of from 20 to 30 feet. I should think there could not be more than 5 or 6 feet water on it."

The position of the rock when *breaking* was determined by Mr. Polkinghorne by bearings taken from the shore, at the following points:—From the north-east end of Auckland island, the rock bore N. by E.,—mount Eden being also in line—from the highest part or centre of Enderby island N. by W. ½ W.; and from the north-east point of Enderby island N.N.W. ½ W. By the present chart these bearings would place the danger about 3½ miles from Enderby island, but as the relative points from which they were taken may not be accurately placed on the chart, and as the compass might have been affected by the magnetic nature of the ground, a feature prominent on the shores of this group, the position of the rock must be considered only as approximate. As it was not seen either by the *Terror*, in 1840, or from the *Fantome*, in 1852, when those vessels were making for port Ross, nor from the *Victoria** when rounding the north end of Enderby island, or from the summit of this island in

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* H.M. Colonial steam-vessel *Victoria*, Commander W. H. Norman, was sent by the Provincial Governments of Australia in October 1865, in search of shipwrecked people at the Auckland and other outlying islands, south and east of New Zealand; consequent on the wreck of the *Grafton* at the Auckland islands, and subsequent escape of her commander Mr. Thomas Musgrave and a portion of the crew, (after a detention of twenty months,) to New Zealand.

1865; it is necessary when navigating in this locality to observe the greatest caution.

H.M.S. *Cossack* having visited the islands in February, 1873, the following information as to the position of the Bristow rock, is given by Navigating Lieutenant E. O. Hallett.—With mount Eden bearing S.W. ½ S., and the north extreme of Enderby island W. by S., Bristow rock, which was breaking heavily, bore N.W. by W. ⅓ W.; and with the break seen just open of the north-east extreme of Enderby island bearing N.W. by N., Ocean island bore S.W. by W. ½ W.; this places the rock a little over 2½ miles from the north extreme of Enderby island, and is the position given to it on the chart. The rock was seen the same day, during perfectly calm weather, from Enderby island, whilst a north-easterly swell broke furiously over it. Three days afterwards the *Cossack* steamed along the north shore of the island, at a distance of about 1½ miles, passing between the rock and Enderby island, but nothing was seen of it, as was the case of the several ships above-mentioned.

The tide-rips off the north point of Enderby island extend a long way to the north-east, at times to a distance of 12 miles, and to a stranger have a most alarming appearance. The flood sets N.N.E., and the ebb to the southward.

NORTH-WEST CAPE.—The North-west cape is a remarkable bold high headland, with a rocky islet and a curious conical rock off it; just eastward of the cape is Black head, a dark-looking promontory with a deep cavernous indentation at its base.

WEST COAST.—The whole western coast of the island is one continuous perpendicular wall from 200 to 800 feet high. In places the cliffs are split and riven asunder, and some remarkable pointed isolated rocks, from 100 to 300 feet high, are formed close under the cliff, which cannot be perceived unless close in-shore.

Disappointment island, between which and the shore are the Sugar-loaf rocks, is small in extent, high, rocky, and inaccessible; the island lies 3 miles from the middle of a bight, and just outside the line between the north-west and south-west capes of the main island.

"Disappointment island, at a distance from the northward, presents the appearance of three sugar-loaf mountains, and the whole western coast has a most inhospitable, rugged, and ironbound appearance; it is washed by the heavy sea thrown in by the prevailing westerly gales. A strong current sets between the island and the main, and the passage, although there are 40 fathoms water, is unsafe even in fine weather for any other than a large whale boat."*

Between North-west cape and Disappointment island, several pinnacle islets and rocks, some of the latter awash, have been seen, the coast inside being formed of high perpendicular cliffs.

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* Mr. Charles J. Polkinghorne, Master H.M.S. *Fantome*, 1852.

Carnley harbour.—At the south-west end of the coast is the western entrance into Carnley harbour. The passage, westward of Monumental islet, is not more than 100 yards wide, and the least water found by the *Victoria* was 3½ fathoms (half-ebb) on a rocky ridge running directly across, with a sudden overfall into 13 fathoms towards the sea, causing a very dangerous rip, inside which the water was smooth. The *Victoria* anchored in 4½ fathoms water above Figure-of-eight islands in the North arm. A sailing vessel, bound to Carnley harbour from the westward, might derive advantage by taking this entrance; but it could only be done with the wind from between south-west and south-east, and should not be attempted unless with a strong breeze at slack high-water (which is about Noon at full and change), and by a person who has a knowledge of the place.

PORT ROSS or SARAH'S BOSOM HARBOUR.[*]—The entrance to this port, situated at the north-eastern end of the group, is between Enderby island on the north and Ewing island on the south. It is one mile wide and runs nearly 7 miles to the south-westward, narrowing to a third of a mile at its head, and having from 20 fathoms water at the entrance to 3½ fathoms at its inner part. The shores of this large inlet are indented with several bays, surrounded by basaltic rocks easy of approach; the whole encircled by elevated land, clothed with trees from the seaboard to the summit; the soil, of volcanic formation, is covered with a thick layer of vegetable débris, producing a dense growth of large ferns.

ENDERBY ISLAND, the north-eastern of the group, is 2½ miles long east and west, of no great elevation, covered with vegetation, the trees in general being 15 or 20 feet, with others 70 feet high; and is well supplied with water. Between it and the main coast is Rose island, separated by narrow boat channels, through which the tide sets very strong, the sea occasionally breaking right across. Sandy bay, on the south side of Enderby island, 1¾ miles from its east extreme, is a convenient temporary anchorage, being protected from all winds except those from the south-eastward; the holding ground is tenacious clay.

When Captain Norman, of the *Victoria*, visited the island, several sea-lions were seen and three killed; English grass was growing in great profusion, as also vegetables in a wild state. A few goats and rabbits were landed, which at once took to the English grass. The *Victoria* steamed slowly round the island, and in a small bay on the north side several seals were observed. The vessel kept close in shore, within half a mile, both leads going with no bottom at 10 fathoms.

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[*] *See* plan of port Ross or Sarah's bosom harbour, on Admiralty chart No. 1,114; scale, *m* = 2 inches.

"On rounding the north-east cape of Enderby island, we passed through some strong whirlpools, occasioned by the meeting of the tides off this point; and although we did not find soundings with our ordinary hand lines, it is by no means improbable that some shoals or rocky patches may have some influence in producing these strong and dangerous eddies. As we opened the harbour, the squalls came down from the western hills with much violence, threatening to blow us out to sea again; and it required the utmost vigilance and activity of the officers and crew in beating up, at times, to maintain the ground we had gained. There is, however, ample space, and no concealed dangers, the belts of sea-weed, which line the shores and rocks, point out the shallow or dangerous parts."*

Deas head, about three-quarters of a mile south-westward of Rose island, is an interesting feature, being formed of basaltic columns 300 feet high, which are highly magnetic.

Terror cove, three-quarters of a mile southward of Deas head, is where Sir James Ross anchored the *Terror* and fixed his observatory in 1840. In the old charts this is Sarah's bosom, named by Captain Bristow after his ship, in his second visit to these islands in 1807. The results of Sir James Ross, place his observatory station (on the north side of the mouth of a small stream), in lat. 50° 32′ 30″ S., long. 166° 12′ 34″ East of Greenwich. Dip of the needle was 73° 12′. The average temperature from 20th November to 12th December 1840 was 45½°.

Erebus cove is south of Terror cove, separated by a projecting point. The establishment of the Southern Whale fishery was formerly on the south side of this cove. On the shore westward of this the beach is good for landing, and the shore being level is suitable for wharfage, &c. The depôt is situated close to the watering place, and is provided with provisions, stores, and ammunition; it is a square wooden house, nearly white from exposure to the weather.

Vessels may lie in these coves nearly landlocked. Water and wood are in abundance: winged game, &c. plentiful.

In October 1865, numerous trees, such as the ash, oak, and pine, with seeds of the turnip, carrot, lettuce, parsnip, pumpkin, &c., were planted on the south side of Erebus cove, by Captain Norman. Four goats (three females and one male), were also landed. No traces of pigs were seen here, or northward of Chambres inlet, as they appear to keep about the middle of the island; but a dog was seen.†

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* Captain Sir James Clark Ross, 1840.

† During the stay of the survivors of the crew of the *General Grant*, wrecked on the west side of the island in May 1866, a bull-dog (ears cut) with others came near their hut (Musgrave's hut in the North arm), and the impression was that these dogs had not been long on the island. Also, when on a visit to a bay known to sealers as Faith harbour, at the north-west point of the island, for the purpose of procuring planking, the first pig tracks were observed, and a sucker was captured; on a second visit another was caught. The method adopted for securing these animals was by a hook of half-

TIDES.—It is high-water, full and change, in Terror cove at Noon; springs rise about 3 feet. A remarkable oscillation of the tide when near the time of high-water was observed; after rising to nearly its height, the tide would fall 2 or 3 inches, and then rise again between 3 and 4 inches, so as to exceed its former height rather more than an inch. This irregular movement generally occupied rather more than an hour, of which the fall continued about 20 minutes, and the rise again upwards of 50 minutes of the interval.

Shoe island, in the middle of the harbour, and lying off Terror cove, is a cable in length, picturesque, bold, highly magnetic, and steep-to.

Laurie harbour, at the head of port Ross, is about 2 miles long in a S.W. by W. and N.E. by E. direction, with an average breadth of 4 cables. Shallow water and weeds extend a quarter of a mile eastward from the point which separates the harbour from Erebus cove, to which a berth should be given. It is more secure than either Erebus or Terror cove, being entirely landlocked; there is a large stream of water at its head, and here appears to be a suitable place for a settlement. The rocks are covered with limpets, and small fish of various kinds are to be caught in abundance amongst the kelp. A few grey ducks, snipes, cormorants, and the common shag are seen here; the land birds are excellent eating, especially the hawks.

Ocean island lies three-quarters of a mile westward of Ewing island, and is connected by shoal water with Tucker point, the south-east entrance point of the harbour.

Ewing island, with Yule islet 3 cables south-east of it, lies on the south side of the entrance to port Ross, with a shoal, covered with kelp, extending about half a mile from the south-west part of the island. The passage between Ewing and French's island is not recommended.

Dundas and Green islets, are two small islets 1½ miles apart and connected by a reef, lying about 2½ miles south-eastward of Ewing island. The reef, covered in parts at high water, generally shows by the breakers which extend a mile north-eastward of the low outer islet. Mariners approaching port Ross from the eastward should carefully avoid this danger, as in thick weather a vessel might be in the breakers without having seen the land. The *Victoria* passed midway between Dundas islet and the point westward of it.

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inch iron, similar to an ordinary fish hook without barb, a foot long. To this a line made of flax was attached (flax grows but sparingly on the island); the hook was then slightly tied to the end of a pole 10 feet long, and the end of the rope held with the pole. They then crept towards the pigs when feeding, hooked and caught them by the line; by this process a number were secured. These hooks were left at the huts on Enderby island.

Blanche rock, a sunken danger which breaks, lies S.S.E. ¾ E. 1¼ miles from Dundas islet.

Note.—Breakers were seen from H.M.S. *Emerald* in 1879, when passing Blanche rock, both in the vicinity of that danger and to the southward of it.

ADAMS ISLAND, the southernmost of the group, rises about 2,000 feet above the sea, and faces the south end of Auckland or the main island, forming between a channel extending the whole breadth of the islands, called Adams strait or Carnley harbour.

The western entrance to Carnley harbour is very narrow and only fit for small steamers; there is a large whirlpool in the narrowest part. Soundings vary from 13 to 3½ fathoms. (*See* page 366.)

Carnley harbour.—The eastern entrance to Adams strait or Carnley harbour, about 7 miles north-eastward of the South cape of Adams island, is formed by two bluff points; thence the strait runs westward about 6 miles to the entrance of an irregular inlet which continues northward and north-west into Auckland island, one branch of which is Musgrave harbour, and the other North arm; the latter forms a fine basin with room for several vessels. Its head, where is situated the group of Figure-of-eight islands, is about 5 miles from the mouth of the inlet. The water in this end of the strait and in the inlet is deep, but a vessel may anchor in the harbours in as little as 4 fathoms, clay bottom. In bad weather the wind comes down over the high land in severe squalls and whirlwinds, which are dangerous for boats under sail.

Anchorage.—There is a good anchorage in 11 fathoms, inside Flagstaff point, which may be recognised by a sandy beach.

Vessels intending to anchor inside Figure-of-eight islands, should pass northward of that group, as the channel south of them is obstructed by reefs.

The depôt in this harbour is situated in a ruined house at Epigwaitt, on the east side of North arm, and a notice to that effect has been placed on Flagstaff point.

Captain Norman landed here six Muscovy ducks. Several young trees were planted and canary seed sown at the head of Musgrave harbour. The thermometer from the 19th to the 27th of the month (October) ranged from 33° to 42°, and the barometer varied from 28·52 to 29·50, blowing a part of the time a strong gale.

Musgrave inlet, on the east side of Auckland island, is about 5 miles deep and runs westward and W.S.W. to its head. Its entrance is on the north side of a point, with a large black-looking flat rock off it, about 10 feet above water. There are 20 fathoms a quarter of a mile from the point, and the same depth up to the entrance of the inlet. Under the round bluff head, on the south side, is a 9-fathom patch marked by kelp, and about 2 miles within there is a bank running straight across the inlet; it has 6 fathoms water within 50 yards of the south side, the ground is even and the depth increases to 8 fathoms at the same distance from the north side; the distance across is about 3 cables, it is marked by kelp, and a vessel may anchor here, but at the head of the inlet there is anchorage in from 12 to 7 fathoms water, perfectly landlocked, and the breadth across about 2 cables.*

Hanfield inlet, south-west of Musgrave inlet, has two arms; in the northern, there is a small sandy beach about 50 feet in length, and the only sand seen. The *Victoria* moored here in October 1865, in 7 fathoms water. The inlet is open to the north-east, but the wind rarely blows from this quarter. Turnips were growing close to the water, in the sandy soil. There is a magnificent waterfall in the southern arm.

Smith harbour, north of Musgrave inlet, first runs westward and then southward, forming a good harbour for a steamer or small vessel. It is some distance to the head, and its narrowest part is a quarter of a mile wide. The anchorage is landlocked and safe, with from 9 to 3 fathoms water. The head of the inlet is within 200 or 300 yards of Musgrave inlet. A fine stream of water runs into it, and here in 1865 marks of pigs were observed; some of these animals must have been of large size, for many of the footprints were nearly as large as those of a deer, and the ground was rooted up in every direction.

To the northward of Smith harbour are Norman, Griffith, Granger, and Chambres inlets, all running more or less into the land and open to the eastward.

CAMPBELL ISLAND.

Variation in 1883.

18° 45′ East.

CAMPBELL ISLAND was discovered in 1810 by Frederick Hazelburgh, master of the brig *Perseverance*, owned by Mr. Robert Campbell, of Sydney. He describes the island as being 30 miles in circumference, the country as mountainous, and that several good harbours existed, of which two on the eastern side were to be preferred. The southernmost of these harbours he named after his vessel.

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* The account of the east coast of Auckland island is from the journal of Capt. Thomas Musgrave, 1865, late of the schooner *Grafton*; hence the name of this inlet.

PERSEVERANCE HARBOUR.[*]—The entrance to this harbour is half a mile wide, thence it runs westward 3 miles, and then south-westward to its head. The shores on either side are steep and rise abruptly to between 800 and 900 feet. The highest hill seen from the harbour is on its north side (Lyall hill), and has an elevation of 1,355 feet. The hills have a more desolate appearance than those of the Auckland islands, being less wooded, but although abundance of wood exists in the sheltered places, the trees nowhere attain so great a height as in those islands. The trees especially indicate, by their prostrate position, the prevailing power of the westerly gales. The occurrence of sudden and violent rushes of wind is a remarkable and characteristic phenomenon of all the islands situated in about this latitude. It is similarly observed at Kerguelen island, and at the Auckland islands.

In the outer part of the harbour the water is too deep for convenient anchorage, but in the inner part, which is completely landlocked, there is abundant room for a large number of ships to lie in security. Water is plentiful.

Terror shoal.—The shores are skirted by a belt of sea-weed, and are free from danger excepting Shoal point, on the south shore, where, at the turn to the inner part of the harbour, H.M.S. *Terror* grounded in 1840; and a shoal situated on the north shore, north-eastward of Terror shoal, which is plainly marked by kelp.

The observation spot of Sir James Ross, on the beach, just east of Shoal point, is in lat. 52° 33′ 26″ S., long. 169° 8′ 41″ East of Greenwich. Dip of the needle 73° 53′.

TIDES.—It is high water, full and change, in Perseverance harbour at Noon; springs rise 4 feet. There are the same irregularities of tide here as at port Ross, Auckland islands.[†]

The depôt of provisions in this harbour is situated in Tucker cove, and the position is indicated by a white staff.[‡]

The *Victoria* visited this island on the 29th of October 1865, in search of shipwrecked people, anchored at midnight in Perseverance harbour, and so obtained shelter from a gale then threatening. Bar. 28°·91. Therm. 46°. Captain Norman in his journal states:—" Started three parties at 8 a.m. to ascend the hills around us, for the purpose of overlooking the shores of the island, and examining the interior. The report furnished by the parties on their return to the ship was to the effect that, from the various heights excellent views had been obtained, but that no signs of any wrecks, or of the presence of anyone having been living on the island lately, were seen."

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[*] *See* plan on Admiralty chart, No. 1,114; scale, *m* = 2 inches.

[†] The description of this harbour is by Captain Sir James C. Ross, 1840.

[‡] During the visit of H.M.S. *Blanche* in February 1874, this depôt was examined and found in good order. Water is abundant at the head of the bays in the harbour; no pigs were seen, but geese and wild duck were seen at the head of the harbour.

"The travelling through the interior was, in some parts, very difficult; the soil is similar to that of the Auckland islands—a soft boggy peat; the vegetation consisting of a long wiry grass, growing in tufts, and a dense low scrub; no tracks of any animals were seen by either of the parties. Much labour and exertion are required to force a way through the dense scrub and grass, and the presence of a number of deep holes, discovered only by finding one's self at the bottom. Some of the points could be reached only by climbing barefooted up precipitous rocks, some of which were of considerable height. Dr. Chambers, of the *Victoria*, planted some English trees, consisting of six oaks, six elms, and one ash. Three pigs, game-fowls, geese, and guinea-fowls were landed, at the head of the harbour."

The following description of Campbell island is from remarks by Navigating Lieut. Hallett, H.M.S. *Cossack*:—7.30 a.m. February 11, 1873. Sighted Campbell island bearing East; the first land seen was three large rocks on the west side of the island, these stood out boldly through the mist which hung over the land. The north-west rock is about 300 feet high, close to which, on the south side, is another and much smaller rock about 200 feet; the two other high rocks are each about 300 feet high. Off the south-west point of the island, is a still larger and higher rock or islet (600 feet); inside these were a number of smaller rocks, one very conspicuous to the north-westward of the south-west islet, resembling a cloaked figure on a pedestal, most likely giving the name, Monument harbour, to the indentation in the land near it; these rocks were passed at a distance of about 2 miles, no outlying dangers were to be seen.

After rounding the rock or islet off the south-west point, the ship steamed along the land at a distance of about 2 miles on north-easterly courses, until a dark perpendicular headland was seen bearing N.N.W., when course was altered to N. by W., and a deep indentation in the land soon showed itself, which proved to be Perseverance harbour.

The *Cossack* anchored in Perseverance harbour in 10 fathoms, with Beeman hill N.W. ½ N. During the stay of the ship (3 days) it blew hard from North to N.N.W., ending in south-west, heavy squalls coming down from the hills; in one of these the ship dragged her anchor; shifted berth farther out, anchoring in 12 fathoms, Beeman hill N.W. by W. ½ W.

After leaving Perseverance harbour, and when about 10 miles distant from the land, with the north-east point of the island bearing W. by N., the south-west point S.W. ½ W., and Erebus point S.W. by W. ½ W., the entrance to the harbour was immediately under what appeared to be the highest part of the island.

The south part of the island is much higher than the north; the south-west point is well elevated ending in a bluff 300 feet high, with the before-mentioned islet off it. North of Erebus point about half a mile, is a dark perpendicular bluff about 300 feet high, this is the easternmost point of the island, whence the land falls back to the north-east point, off which there is a conspicuous rock. The point itself is jagged, and when bearing N.W. appears like steps of unequal length and height; the north point is perpendicular and about 400 feet high.

North-east harbour or Penguin bay, on the east side of Campbell island, may be known by Cossack rock, a small round island which lies off the north point of the entrance; the harbour extends south-westward 3 miles, and increases in width towards the head, terminating in two creeks. At the head of it is a fine valley, through which runs a considerable stream of water, the largest in the island; vegetation appears more healthy here than elsewhere on the island, owing to it being less exposed to westerly winds. Penguin bay is easier of access than port Perseverance, and it seems more frequented than the other anchorages by the whalers, of whom there are many traces; there is anchorage in all parts of the bay, the depth being from 5½ to 8½ fathoms; easterly winds seldom blow here.

The bays on the south side of Campbell island (Boat harbour and Monument harbour of the plan) afford no shelter, and the coast presents a desolate and storm-beaten appearance.

ANTIPODES ISLANDS.

Variation in 1883.

17° 25′ East.

ANTIPODES ISLANDS.—This isolated group consists of several detached rocky islands lying nearly north and south over a space of 4 to 5 miles.

The *Victoria* visited the group in November 1865, experiencing heavy gales from N.W. to W.S.W., the ship was kept under the lee of the group, and 60 fathoms water found within half a cable of the shore.

Commander Norman states that the largest island is apparently about 1,100 feet high, and the perpendicular cliffs which encircle it vary from 200 to 600 feet, whilst on the top and sides of the hills the only vegetation seen was some long grass and fern or scrub of a dark colour. At the north-west cape is an immense cave, in height about 120 feet. Several small islets, from 150 to 200 feet high, lie off its north, north-east, and east side, none of them more than a mile distant from the main island, and they all appear safe to approach or to pass between. Landing appears impracticable, unless it be at the E.N.E. corner, where rocks jut out a short distance; owing to the high sea at the time, no attempt to land was made. Commander Norman places the Antipodes island in lat. 49° 42′ S., long. 178° 43′ E., thus verifying the position by several recent navigators.

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* *See* Admiralty chart, No. 788, South Pacific ocean, western sheet; scale, *d* = 0·6 of an inch.

Captain Musgrave describes the group as consisting of rocks, the largest of which is about 9 miles in circumference, wedge-shaped in appearance with the pointed end to the northward, and covered with perished-looking grass of a brown colour. It is surrounded by small rocky high islets, which like the large island, present on all sides, a bold, perpendicular, inaccessible basaltic front. Those off the north point lie farthest from the shore, distant about three-quarters of a mile.*

The following is from remarks by Navigating Lieut. Hallett, of H.M.S. *Cossack*, 1873.—Sighted Antipodes islands bearing N.E. ½ E., and passed along the north shore of the large island at a distance of about 2 miles; it has a most barren and inhospitable appearance. Off the west side of the largest island is a rock having a large arch in the centre, and off the north-west point is a high pinnacle rock with apparently deep water between it and the island; close to the north-east point is an island seemingly an extinct crater. The cliffs are partially covered with a dark green moss-like vegetation; there are numerous large caverns in the face of the cliffs.

The only place where it would be likely to effect a landing, is a little to the southward of the north-east extreme of the large island, there, the cliff having fallen away has formed a shelving point on which the sea seemed to break lightly, it is sheltered also from the prevailing westerly winds.

BOUNTY ISLANDS.

Variation in 1883.

17° 0′ E.

BOUNTY ISLANDS.—This little cluster of rocky islets—thirteen in number, and without verdure—cover a space of 3½ miles east and west, by 1½ miles north and south. The western is the largest and may be seen at a distance of 20 miles. At 10 miles South of the eastern island there are 75 fathoms water, fine white sand; and 18 miles E.S.E. of this position, 104 fathoms, fine brimstone coloured sand.†

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* Information from a report by Commander W. H. Norman, 1865 (*see* foot note, page 364).

† *See* Admiralty chart, No. 788, South Pacific ocean, western sheet; scale, *d* = 0·6 of an inch.

Captain Bligh, R.N., the discoverer in 1788, and from whom the above description is taken, placed the group in lat. 47° 44′ S., long. 179° 7′ E.

The *Victoria*, Commander Norman, visited the Bounty islands in November 1865, when outlying sunken rocks, very dangerous to approach, were found about 3½ miles off the W.N.W. side. With the group bearing N.N.W. 2½ miles, soundings in 85 fathoms, shells and sand, were obtained, and at 8 miles distant, 95 fathoms, fine sand of brimstone colour. The group, on examination, was found to consist of twenty-four small islets from 100 to 300 feet high (with 40 fathoms water half a cable off the north-east side), destitute of vegetation, without landing, and the resort of a great number of penguins and other sea birds. Captain Norman places the group in lat. 47° 50′ S., long. 179° 0′ E.

Remarks on the Bounty islands, by Navigating Lieut. B. J. Jackson, of H.M.S. *Rosario*, 1870.—I counted twenty in all, but half of them were not more than 10 or 15 feet out of water; the largest, which is the westernmost but one, covers from 8 to 10 acres.

The group might be divided into two clusters, with a passage between them; there is a rock nearly in the centre, over which the sea breaking and the spray thrown up, presented a grand appearance; there is also a blow hole in one of the western cluster which throws clouds of spray some 300 feet high. The sea was seen breaking from 3 to 4 miles to the westward, probably over the sunken rocks reported by Commander Norman of the colonial steamer *Victoria*.

Caution.—There is also a sunken rock southward of the group, bearing from its western extreme S. ½ W., and from the eastern extreme S.W. ½ S., distant 3½ miles, or 2¾ miles off shore. These rocks are exceedingly dangerous, and great care should be taken in approaching the islands in thick weather, as they sometimes do not break for 5 or 10 minutes.

The eastern islet, which is one of the highest, is 280 feet high. Lat. 47° 46′ S., long. 178° 56′ 44″ E.

The following soundings were obtained: with western extreme of islands N.E. by E., 2½ miles, 71 fathoms, fine light sand and stones; eastern extreme N.N.W. ½ W., 2 miles, 84 fathoms, yellow sand and shells; west extreme, South, 3 miles, 93 fathoms, fine light sand and granite; centre of group N.E. by E. ½ E., 4½ miles, 98 fathoms, fine light sand and shells; eastern extreme, S.W. ½ S., 2½ miles, 89 fathoms, fine light sand and shells; centre of group, N.E. by E. ½ E., 12 miles, 110 fathoms. With the western extreme of group bearing N.E. by E., 2½ miles, on looking over the side, the ship appeared to be in shoal water with a white sandy bottom; on getting a cast of the lead 71 fathoms, light sand and shells, was found.

The paucity of birds about the islands was remarkable.

CHATHAM ISLANDS.

Variation in 1883.

Point Munning, 15° 10′ E.

This group, included between the parallels of 43° 35′ and 44° 25′ S., and the meridians of 176° 0′ and 176° 55′ W., and about 365 miles eastward of cape Palliser, Cook strait, New Zealand, consists of two islands—the principal and largest is Whare-kauri or Chatham island, and the other Rangiauria or Pitt island—as also several detached high islets and rocks. They were discovered on the 29th November 1791, by Lieut. William R. Broughton, in command of H.M. brig *Chatham*, and the following description is extracted from his narrative:—*

"Early in the morning low land was discovered between the bearings of N.E. and E.N.E., when the vessel was in 40 fathoms water. When the north-west point of this low land—named point Alison after the man who fortunately saw it—bore S. ¾ E. distant about 9 miles, the depth was 38 fathoms, sand and shells. A remarkably rugged, rocky mountain obtained the name of mount Patterson. The interior land was of moderate height, rising gradually, and forming several peaked hills, which at a distance have the appearance of islands."

"From point Alison to mount Patterson the shore is low and covered with wood, from thence to an abrupt cape eastward was a continued white beach, on which some sandy cliffs and black rocks were interspersed, apparently detached from the shore. To the eastward of these rocks, between them and a flat projecting point, the land seemed to form a bay open to the westward. From this point to the cape, a distance of about 2 miles, the cliffs are covered with wood and coarse grass. These cliffs are of moderate height, composed of a reddish clay mixed with black rocks. The above cape forms a conspicuous headland, and is the northernmost of the island. I called it cape Young."

"We steered from cape Young E. b. N., keeping between 2 and 3 miles from the coast, with regular soundings from 25 to 22 fathoms. The shore is a continued white sandy beach, on which the surf ran very high. Some high land, rising gradually from the beach and covered with wood, extends about 4 miles to the eastward of the cape. After passing this land, we opened the several hills over the low land we had seen in the morning, and could discern that many of them were covered like our heaths in England, but destitute of trees."

"The beach is interrupted at unequal distances by projecting rocky points covered with wood. After sailing about 10 leagues, we came abreast of a small sandy bay. Water was seen over the beach, and the country had the appearance of being very pleasant. With our glasses we perceived some people hauling up a canoe, and several others behind the rocks in the bay. We came to an anchor about one mile from the shore in 20 fathoms water, sandy and rocky bottom. The eastern point bore by compass N. 78° E. and cape Young W. 12° S.; the eastern point from our anchorage proved to be the termination of the island, to which I gave the name of point Munning."

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* *See* Admiralty chart, No. 788, South Pacific ocean, western sheet; scale, *d* = 0·6 of an inch: also Admiralty chart, Chatham islands, No. 1,417; scale, *m* = 0·2 of an inch. (Plans, Skirmish bay, port Waitangi, Whangaroa or port Hutt).

"Having reached the shore without any interruption, we displayed the union flag, turned a turf, and took possession of the island, which I named Chatham island (in honour of the Earl of Chatham), in the name of His Majesty King George the Third, under the presumption of our being the first discoverers."

"We got under weigh with a fresh gale at south-west; on passing point Munning, which is the north-east extremity of the island, it was seen to be a low peninsula. From the bay which I called Skirmish bay to point Munning, the shore is low, rocky, and clothed with wood. Pursued our way to the N.E. In the course of the following day passed many patches of seaweed, and saw some port Egmont hens, and several oceanic birds."

"The natives were found to be of a middling size, some stoutly made, well limbed, and fleshy. Their hair, both of the head and beard, was black, and by some was worn long, and they were dressed in seal skins or mats neatly made. They seemed a cheerful race, our conversation frequently exciting violent bursts of laughter amongst them. On our first landing their surprise and exclamation can hardly be imagined." Although unprovoked, they made an assault on Lieut. Broughton and his crew upon his return to the boat, and a skirmish ensued, in which one of the natives was killed. This officer says: "I have to lament that the hostility of its inhabitants rendered the melancholy fate that attended one of them unavoidable, and prevented our researches extending further than the beach, and the immediate entrance of the adjoining wood."

From the time of the discovery of these islands they had not been visited for many years, except by whalers, when their existence becoming known to the New Zealanders, a number of the latter during the native wars fled thither from port Nicholson. On their arrival they conquered and enslaved the islanders, who, although belonging to the Polynesian race and speaking a dialect similar to that of the New Zealanders, appeared to have had nothing in common with them.

Dr. Dieffenbach, who visited the islands in 1840, thus writes:—"The sealers who first visited the islands—and I met with some who had been there ten years ago—found the natives numerous and healthy, in number at least 1,200, and they were received by them with a hearty welcome.

What a wretched change has taken place in the short interval which has since elapsed !—a change occasioned by the importation of about 800 New Zealanders, brought thither by a European ship in 1830 or 1831. Not ninety of the original natives now survive in the whole group, and in a short time every trace of them will be lost, as even the New Zealanders have disdained to intermarry with them."

WHARE-KAURI, the largest island, is of irregular formation, its north side extending in a W.S.W. and E.N.E. direction about 31 miles, and the island from north to south 26 miles, with its coast line deeply indented by large bays. The ensuing description is abridged from the travels of Dr. Dieffenbach, who visited these islands in 1840 :[*]—The surface in the northern half of the island is generally undulating, deep, and boggy ; in the hollows it is often marshy ; but from its height above the sea the land can everywhere be easily drained. This promises to be highly productive, and equally fit for grain or pasturage. Wherever the superfluous water has been carried off by a natural outlet, a rich vegetation of fern and New Zealand flax (*phormium tenax*) has sprung up, giving additional firmness to the soil by decayed leaves, and yielding a rich harvest to the native planter. This is particularly the case on the low hills above the sea shore, which are well wooded, and encircle the island with a verdant zone.

Where these hills are sandy, the decayed leaves cast by the trees have formed a light, black soil, which the natives prefer for agriculture. The conical hills, which rest on a volcanic rock, have very rich soil in their neighbourhood, which is generally covered with a vegetation of fern and trees, agreeably mixed together, and these fertile spots are like so many oases rising from the surrounding bog. On the west side of Whangaroa bay, and at other places between Maunga-nui and Emo-kawa, the soil has been set on fire by some cause or other, and is burning slowly beneath the surface ; the temperature, although neither flames nor fire are visible, is much raised. " Te ahi kai kai te one one " (the fire consumes the earth), say the natives ; and, in consequence of this slow combustion, which had begun before the New Zealand colonists settled here, six years ago, and may, indeed, be traced to a much earlier period, the soil in the neighbourhood is gradually sinking.

The vegetation of these places is extremely vigorous, though the soil is perfectly dry. A phenomenon like this, of a burning soil, is not unparalleled, as in several places beds of coal, accidentally ignited, have continued to burn slowly for a long series of years ; this is therefore explicable, without any reference to volcanic agency. What has been already said applies almost exclusively to the northern part of the island, which presents another remarkable feature, viz., several lakes usually surrounded by gently sloping hills. They are most frequent near the northern coast, and are usually one or 2 miles in circumference. There are some also not far from the beach near the western coast; the largest of which is at the head of Waitangi bay, and about 6 miles in circumference. A river named Te Manga-pe, from 6 to 8 yards broad, drains this lake, and is tributary to another river, which enters Waitangi harbour. The hills surrounding these lakes are slightly wooded, and form a beautiful feature in the Whare-kauri landscape. The shores of the Manga-pe river are low, and, at some places, its water is stagnant.

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[*] *See* Journal of the Royal Geographical Society, vol. ii., p. 195.

This lake is separated by a range of low hills from Te Whanga, the largest lake in the island, which is, however, brackish. It is about 15 miles long, and 4½ broad, and therefore occupies a large portion of the whole island, and is surrounded by hills either wooded or boggy. On the eastern side it is separated from the sea by low sand-hills about 100 yards broad. At one place the intervening hills disappear, and between the lake and the sea there is only a low sandy beach; the level of the lake is about 2 feet above high-water mark, and according to the natives the sea never encroaches upon it. The water is only slightly brackish, probably from infiltration, as it is supplied by two large streams, otherwise the water would be fresh. These streams descend in a serpentine course from a range of low hills which run from north to south to the southern extremity of the island, and although only a few yards broad, they are deep and rapid, discharging their waters into a long branch of the lake. Te Whanga occasionally empties its waters into the sea, by breaking over the low barriers. The land at its southern extremity is then left dry to the extent of several miles, and the way from Waikere, a native settlement on the eastern shore, to port Waitangi on the western is much shortened.

The Mangahau, or Nairn, the principal stream which flows into Waitangi bay, rises from a range of hills in the southern part of the island, near the two rivers, which discharge themselves into lake Whanga. The bar at its mouth is passable by a boat only at high water; but beyond the bar the river is navigable for about 3 miles, at low water, as the depth is often 12 feet, though the channel is narrow, it then becomes a mere rivulet, winding its way through a deep valley from east to west. The length of the Mangahau is about 5 miles; at its mouth the left shore is higher than the right, and both are wooded or covered with fern.

The larger and better part of the island is that to the southward of Waitangi harbour. Here it has an undulating surface, is not so boggy as other parts of the island, and is either covered with an open forest of moderate sized trees, or with high fern, where the land can be brought into cultivation with little labour. In general the soil is extremely fertile, and preferred by the natives to that of New Zealand. The winds which sweep over these islands are not sufficiently violent to injure vegetation and it is only in a few peculiarly exposed places on the coast that the shrubs appear stunted.

In the months of May, June, and July, Dr. Dieffenbach found the climate mild and agreeable. After 8 a.m. the thermometer was never below 45° or above 60°, though it was then the winter season. He mentions as being often obliged to sleep in the open air, covered only by a light cloak; and although it was sometimes wet with dew in the morning, never experienced inconvenience. Being surrounded by the sea the air is always moist and cool, but never misty, the vapour being carried off by the constant breezes. Even during winter the sky is generally cloudless and of the deepest blue.

The changes of temperature are neither so sudden nor so frequent as in New Zealand, where they result from the neighbourhood of high mountains capped with snow. Chatham islands being at a distance from any land, the heat and cold are both moderated by the sea breeze; but there is no want of rain, and showers are experienced for a few hours every week. The prevailing winds are north-east and south-west. The climate appears very favourable to European constitutions.

The COAST.—Petre bay, on the west side of the island, is 13 miles wide between the boundary points, whence the coast falls back 10 miles in a semicircular form. The land here has an undulating surface of small elevation, but rising to the north-west into detached hills, some of which are of a regular pyramidal shape. With the exception of three hillocks at the south-west point of the island, no others are visible in that direction, but the land rises gradually from the rocky shore, and clothed with verdure to the water's edge, the top of the slope spreading out into a level or undulating surface.

On approaching the inner part of the bay, Red bluff will be seen which forms the northern point of Waitangi bay, and 3 miles northward of it is another similar bluff, with a sandy beach backed by low hills between them. From the northern bluff the beach becomes again sandy for some miles, and then continues rocky to the north-west point of the island, being indented by four small bays, the three inner of which are close together. These bays are open to the south-eastward.

The northern side of the island forms several wide open bays; to the westward the shore is flat, and the headlands of the bays run out in long wooded tongues of land. About 6 miles from the north-west point is a group of irregular hills, of little elevation; Maunga-nui, the highest, terminates in a rocky precipice, from the foot of which runs out a spit with a level beach. This spit forms the western termination of a bay, whose eastern boundary, distant 8 miles, is a hilly promontory with steep sides; the shore between is a beach of fine sand backed generally by sand-hills, which are wooded to a short distance inland, and are either shelving or cut down into cliffs by the action of the waves. In the middle of this bay four needle-shaped rocks lie about a cable from the shore.

Eastward of the promontory (cape Young), the shore extends 19 miles to Te Wakuru, the N.E. extreme of the island, with a broad beach and low wooded hills; rocks are scattered along shore, which are uncovered at low water. The entrance to Kaingaroa or Skirmish bay, near the north-east end of the island, is partly obstructed by rocks. The outermost rock off its eastern point is covered, but the water occasionally breaks on it. The rocks above water, off the western point, extend to the middle of the entrance, and are terminated by a sunken rock. Lure reef lies half a mile northward of the west point.

The north-east end of the island is rocky, and reefs extend a long way eastward from Wakuru islet, which is connected with the main island by rocks uncovering at low water. From this islet the east coast of the island trends southward, and forms a bay nearly 3 miles long, with a broad sandy beach backed by low wooded hills. Rocks, most of them only visible at low water, lie scattered along and some distance off shore; and with easterly winds heavy breakers extend several miles from the land. The southern point (*Waikere*) of the above bay is rocky, and thence Hanson bay, 5 miles deep within the line of points and in which are many reefs and frequently a heavy surf, extends 17 miles to the south-east point (cape Fournièr) of the island. Sand-hills are thrown up along the coast, and stunted shrubs cover them on the weather side. Cape Fournièr is a hilly promontory covered with wood.

Anchorage.—The best anchorages on this side of the island are about 4 miles from the north-east extremity, under Waikere point, where a boat can land at all times; and near the wooded promontory at the south-east extreme of the island, the cape, from which extends a long reef, offering some shelter from south-westerly winds. Easterly winds, however, often set in suddenly.

The southern coast of the island is abrupt and precipitous; the land on the summit of the cliffs is level and covered with trees. Small streamlets trickle down the cliffs, and clothe their face with herbage.

MATAKITAKI or MOUNT PATTERSON.—At the north-west end of the island, a chain of hills succeeds to the low undulating surface near the coast. Some of them are regular pyramids with their base running east and west; others have a more irregular shape, and consist of rounded stony masses piled on the top of a mound of earth. All these hills have a volcanic origin, and are formed of either dense and firm, or cellular basalt, the cells of which are either empty or filled with white decomposed carbonate of lime. None of these hills are more than 600 feet in height. The westernmost of them is Matakitaki or mount Patterson, and the extremity of the group nearest the shore forms a perpendicular cliff 100 feet high, but separated from the sea by a flat beach 1½ or 2 miles in breadth.

Near the head of Whangaroa or port Hutt, is a hill called Emo-kawa or Iwa-kawa, nearly 2 miles from which, is Wakapai or mount Dieffenbach, the most regular pyramid, and apparently the highest of all. Only a few miles from it is Wai-papa, likewise pyramidical. The last, and that from which the original name of the island is derived, is Whare-kauri; it rises about one mile from the northern shore, and 15 miles from the west end of the island, it is wooded and consists of several steep declivities.

Rangi-tutahi or Sisters bear from Alison point N. ½ W. 14 miles, and N.W. by W. ½ W. 11 miles from cape Young. They are two small rocky islands near each other, about 100 feet high, flat on the top with steep sides, covered with scanty brushwood, and much frequented by birds. These islands, from their resemblance to each other, Lieut. Broughton named the Sisters. A line of breakers runs between them and North-west reef.

North-west reef.—This danger is reported on tolerably good authority to be situated W. by N. ¾ N. from the Sisters distant 4 miles.

The following remarks on the Chatham islands are by Captain C. W. Hope, of H.M.S. *Brisk*, June 1865:—

Making the land.—On making great Chatham island from the westward mount Maunga-nui, 587 feet high, is very conspicuous, being a rugged hill with a broken irregular outline, appearing to form the north extreme of land; but on approaching nearer, Patterson point, a long low projection, off which there are dangerous reefs extending a mile or more, will be recognised. Mount Dieffenbach will be seen to the right of Maunga-nui, which is a sharp pointed pyramidical hill said to be the highest on the island, but Maunga-nui looks higher. There are other peaks resembling Dieffenbach, but lower.

CUBA CHANNEL.—The *Brisk* approached Alison point on an East course, and then passed through Cuba channel into Petre bay. The coast from Alison point to Somes point appears fringed with rock, and should not be approached nearer than one mile. The sea breaking on West reef may be seen 8 or 10 miles off from the masthead, and on a nearer approach, patches of the reef are visible above water. The reef seems to be correctly placed on the chart, but appears to extend somewhat farther in a north-west direction from the dry part than is there laid down. There is, however, a channel at least 3 miles wide between the reef and Somes point, through which, steaming at half-speed, no bottom could be obtained with 10 fathoms, and there were no indications of any other dangers.

PETRE BAY.—The only anchorages to be recommended in Petre bay are Whangaroa or port Hutt, and port Waitangi, the other bays being exposed to south and south-west winds. On steaming along the southern shore of Petre bay nothing was seen of Heaphy shoal, and it was stated that it had no existence. There was a heavy swell running, but no appearance of a break anywhere off this shore, except upon Jenny reef.

WHANGAROA OR PORT HUTT is sheltered from all winds, but it is very confined, and as with strong west and south-west winds there is a heavy sea at the entrance, a vessel should anchor as far in as possible. The entrance may be easily recognised by the view on the chart.* With the nib or hummock on mount Iwa-kawa open to the eastward of Maunga-nui, as shown in the sketch, the harbour is open, and the white sandy beach at its head will be seen. There are likewise sandy beaches at the head of the two bays to the eastward of Whangaroa, therefore care must be taken not to mistake between them.

The sea breaking on the rocks on either side of the entrance to Whangaroa marks the dangers, and it is only necessary to keep midway between and steer straight in on a N.W. by W. course. A patch of kelp stretches partly across the entrance from Napper reef, but there is deep water where it lies, and the *Brisk* passed through it. The reef off Gordon point must be avoided, but the outer edge of the kelp there marks the deep water.

The *Brisk* anchored inside the line from Gordon point to Evans point in 5 fathoms, coarse sand and shells, with the centre of the little cove behind Evans point bearing N.E. A large vessel should moor if intending to stay any time, as there is scarcely room at single anchor to swing all round unless the anchor were dropped exactly in the centre of the harbour.

Tides.—It is high water, full and change, at port Hutt at 5h. 0m.; springs rise, 4 to 5 feet.

Water.—There is a stream of excellent water at the north-west corner of the harbour, but no fire-wood or supplies of any kind are to be had here (1865), the country for miles round being bleak open moorland intersected

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* *See* plan of port Hutt, and view on Admiralty chart, No. 1,417.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

PORT WAITANGI is the principal place in the Chatham islands [illegible] Europeans. [illegible] New Zealand and Australia. [illegible] English fruits and vegetables come to perfection. [illegible] and there are also [illegible] wild pigs all over the island.

A signal staff has been erected on the hill above point Hanson. The shoal water off this point is marked by kelp.

Landing on the beach is not good.

The anchorage at port Waitangi is not a safe one for large vessels during westerly gales. Vessels drawing not more than 12 or 15 feet may ride out south-west gales by anchoring close in with Hanson point bearing S.W. or S.W. by W.; they will then be in a measure sheltered from the heavy sea, but will experience a rolling swell that will try their cables.

With a gale from north-west this is decidedly a dangerous anchorage. The *Brisk* experienced a heavy south-west gale while at anchor here in May 1866, with Clatchie point bearing W.S.W. in 6 fathoms, fine black sand. The gale lasted 48 hours; one cable parted, and the vessel was in a very critical position, a high breaking sea running, and a strong offset from the shore keeping the ship at times broadside to wind and sea. An American whaler lying farther in also parted a cable, and the crew left her, expecting to be wrecked, but she rode it out safely, as did also a schooner lying close under Hanson point. A shoal having 5 fathoms water on it, is said to lie 1½ miles to the northward of the anchorage, but the exact spot is uncertain. It is, however, known to the natives, who go there to fish.

In 1864, 14 vessels amounting to 5,155 tons entered inwards with cargoes; and 15 vessels amounting to 5,506 tons cleared outwards with cargoes. "For several years this port has been visited by ships for fuel, provisions, and water, which can easily be procured. During my stay there was never less than 5 vessels in the harbour; and in the whole whaling season of 1840, 30 vessels came hither for refreshments."*

The coast from Durham point to Evêque point is high, bold, and apparently clear of danger. Evêque point has close behind it a remarkable hill, 866 feet high, with a cleft rock on the top exactly like a Bishop's mitre, now called the Horns.

PITT STRAIT.—The *Brisk* passed about 1½ miles to the northward of Sentry reef, lying S.E. ¼ S., 5½ miles from Evêque point; the reef is entirely under water, but the sea breaks violently on it.

There is said to be a rock some little distance from the shore, 2 or 3 miles westward of cape Fournièr, but it is out of the ordinary track of vessels passing through Pitt strait, and nothing was seen of it. The residents stated that, with the exception of this rock and Sentry reef, Pitt strait is entirely free from danger; and that the rocks lying off the west and south-west sides of Pitt island are high and steep.

PITT ISLAND (*Rangiauria*), south-eastward of Chatham island, extends 8 miles in a north and south direction and is 3½ miles across, with numerous islets and rocks surrounding it. Moutapu, the north point, bears S.E. ¾ S. distant 11½ miles from cape Fournièr, the south-east point of Chatham island, with Pitt strait intervening.†

The north-west side of the island forms a bay, about 2¾ miles wide and three-quarters of a mile deep between the points, where there is good anchorage with southerly winds.

On the east side of Pitt island there is an anchorage much frequented by whalers, where vessels may ride well sheltered from westerly gales.

North-east reef lies 1¼ miles eastward of the East point of the island.

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* Dr. Dieffenbach writing in 1840.

† *See* Admiralty chart, Chatham islands, No. 1,417; scale, $m = 0\cdot2$ inch.

On the west side of the island there is good anchorage, with northerly and easterly winds, in Waihere bay lying behind Mangere, a precipitous island 940 feet high.

From Mangere island, on a S.W. bearing, extends a remarkable group of rocks; the first, closely adjoining, is the Fort; at the distance of 1½ miles, the Castle; and half a mile beyond the latter, another islet or rock. A fourth islet, named Sail rock, from its extraordinary resemblance to a boat with a gigantic lug-sail, lies W. by S. ½ S. 2¼ miles from the Castle.

Rangatira or S.E. island, 678 feet high, lies a long mile eastward of the southern part of Pitt island, with Passage reef in the channel between.

Fancy rock is a danger, nearly awash, on which the sea breaks heavily, and lies S.E. ¼ E. 1¼ miles from the nearest part of Rangatira; the Pyramid bears from it S.S.W. ¾ W. 5 miles.

A sunken danger (*William Hamilton*) whose position is doubtful, is reported to lie about 3 miles eastward of Rangatira.

The Pyramid, a rock 566 feet high, lies S. by E. 4 miles from the south point of Pitt island; also from the same point, rocks above and below water, extend W.S.W. to South a distance of nearly 2 miles; and Round rock, above water, lies S.W. by W. ½ W. distant nearly 4 miles.

Supplies.—Abundance of fresh meat, potatoes, and vegetables may be obtained at Pitt island, as also poultry, milk, and butter. The island is thickly wooded; the soil very fertile, and, as at the great island, all kinds of European fruits, &c. grow and thrive. Wheat is also cultivated, but not in quantity sufficient for exportation.

ROUND ISLAND of the Star Keys group bears E. by N. ½ N. nearly 9 miles from the north extreme of Pitt island.

EASTERN REEF (*Three rocks*) bears S.E. by E. ¾ E. 27 miles from cape Fournièr, the south-east point of Chatham island; and N.E. by E. 18 miles from the Pyramid lying southward of Pitt island.

BERTIER ROCK.—On leaving the north end of Pitt island, the *Brisk* (1867) steered N.N.E., which took her 4 or 5 miles to the northward of Bertier rock, a flat-topped islet about 150 feet high. This rock lies N.E. by E. ½ E. 22 miles from cape Fournièr, and is nearly on the parallel of 44° S., and has hence obtained the local name of "the Forty-fours."

MACQUARIE ISLAND.

This island has a breadth of 5 or 6 miles, is high and rugged, and seems covered with verdure, but which really is long tufted grass. The highest peak is from 1,200 to 1,500 feet high, without tree or shrub on it; there is no sheltered landing-place for a boat, the coast being rugged and surf-bound, and is tenanted with myriads of sea birds, penguins, and albatrosses. The south end of this island is in lat. 54° 55′ S., long. 158° 56′ E. Off this end a reef extends three-quarters of a mile.*

Bishop and clerk are rocks which lie to the southward of Macquarie island, in lat. 55° 16′ S., long. 158° 55′ E.*

Judge and clerk are two large naked rocks lying to the northward of Macquarie island, in lat. 54° 22′ S., long. 159° 10′ E.*

EMERALD ISLAND.

The existence of this island is very doubtful; the ship *Emerald* in Dec. 1821, lat. 57° 30′ S., long. 162° 12′ E., saw the resemblance of an island, very high, with peaked mountains bearing E. by N. distant about 25 miles. This supposed site was passed by the United States expedition in 1841, without seeing any indication of land.*

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* From Findlay's Directory for the South Pacific ocean, 3rd edition, 1871.

TABLE OF POSITIONS.—NEW ZEALAND.

FROM THE SURVEYS OF HER MAJESTY'S SHIPS ACHERON AND PANDORA, 1848–55.

NOTE.—The Longitudes of these positions have been adapted to the Meridian of fort Macquarie, Sydney, New South Wales:* assumed in 151° 14′ 0″ East from Greenwich, on the authority of the late Lieut. Raper, R.N. See Papers on Maritime Longitudes (Nautical Magazine) and Tables of Maritime Positions.

Place.	Particular Spot.	Latitude. South.	Longitude. East.	Tides. H.W. F. & C.	Tides. Rise.
	NORTH ISLAND.				
		° ′ ″	° ′ ″	h. m.	feet.
Three Kings islands	N.E. island, N.E. extreme	34 6 20	172 9 45	8 0	7 springs
„ „ -	S.W. island, West extreme	34 9 30	172 1 30		
Cape Maria Van Diemen	Cape islet lighthouse -	34 28 30	172 38 40	8 0	7 „
North cape - -	Cape islet - - -	34 25 7	173 4 30	7 0	7 „
Parenga-renga harb.	Kohau or Coal point -	34 31 0	173 1 50	7 54	7 „
Ohora river - -	Repi-repi point - -	34 50 0	173 10 10	8 48	
Rangaounou, or Awanui river -	Te-kotiatia point - -	34 53 12	173 18 34	7 44	7 „
Cape Kara-kara -	Cape extreme - -	34 47 20	173 25 20		
Monganui harbour -	White point - - -	35 0 20	173 33 35	8 15	7 to 5
Stephenson island -	N.W. extreme - -	34 57 45	173 47 30		
Wangaroa harbour -	Peach island - - -	35 1 44	173 46 44	8 15	7 springs
Cavalli islands -	Great island, N.E. extreme	34 59 30	173 58 45	8 0	7 „
Bay of Islands -	Motu-mea islet - -	35 17 0	174 7 2	7 15	6 to 9
„ „ -	Cape Brett (Piercy island)	35 10 30	174 21 10		
Wangaruru harbour	Grove point - - -	35 23 48	174 22 20	7 10	7 to 9
Poor Knights islands	North island, North point	35 28 30	174 44 40		
Tutukaka harbour -	North head - - -	35 37 54	174 34 20	7 0	7 to 9
Bream head - -	Extreme - - -	35 52 15	174 37 30		
Wangari harbour -	Lort point - - -	35 51 9	174 32 10	7 0	7 to 9
Moko-hinou islands -	North-west islet - -	35 54 45	175 5 20		

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* The important meridian of fort Macquarie may yet be open to further investigation; the late Admiral P. P. King, from numerous observations, considered it to be in 151° 15′ 25″; the late Captains Blackwood and Stanley, for their surveys in Australia, adopted 151° 14′ 50″, as reduced from the longitude of Paramatta observatory given in the Nautical Almanac, which Captain Denham, for his operations in the Pacific ocean (1859) also employed. Captain J. L. Stokes, for H.M.S. *Acheron's* surveys, adopted 151° 15′ 30″; an analysis of documents in the Hydrographic Office, embracing observations made between the years 1788 and 1851, by numerous navigators and astronomers, places fort Macquarie in 151° 15′ 5″ E.

en island, sometimes used as the place of observation, lies 0° 0′ 47″ E. of fort Macquarie.

Place.	Particular Spot.	Latitude.	Longitude.	Tides.	
		South.	East.	H.W. F. & C.	Rise.
	North Island—*continued.*				
		° ′ ″	° ′ ″	h. m.	feet.
Great Barrier island	Aiguilles, or Needles point	36 1 15	175 26 30		
” ”	Nagle cove - - -	36 8 48	175 20 35	6 25	7 to 10
” ”	Cape Barrier, extreme -	36 21 50	175 33 0		
Rodney point - -	Extreme - - -	36 16 40	174 51 10		
Kawau island -	Bon Accord harbour, Momono jetty - -	36 26 0	174 50 15	6 30	7 to 10
Auckland harbour -	Depôt point - - -	36 50 5	174 49 10	7 5	9 to 11
Coromandel harbour	Tuhuia island - -	36 48 35	175 25 30	7 0	
Castle hill - -	Summit (1,610 feet) -	36 48 25	175 35 0		
Cape Colville - -	North point - - -	36 28 20	175 22 0		
Cuvier island - -	Highest peak - - -	36 26 30	175 48 20		
Mercury islands -	East island (*Wakahau*); North cliff - -	36 36 15	175 58 20		
Mercury bay - -	Huki-huki pah, entrance of Mangrove river -	36 48 44	175 44 36	7 21	5 to 7
Alderman islands -	East island - - -	36 56 15	176 7 40		
Kati-kati river -	North head - - -	37 26 40	176 0 30		
Mayor island - -	Highest peak (1,110 feet)	37 15 40	176 15 15	7 45	
Tauranga harbour	Maunga-nui Mt. (apex 860 ft.)	37 36 25	176 11 10	7 10	4½ to 6
Astrolabe reef -	Centre (dries 4 feet L. W.)	37 30 45	176 26 45	7 30	
Motiti island - -	North point - - -	37 34 40	176 25 30		
Plate island (*Motu-nau*) -	Centre (166 feet high) -	37 38 15	176 34 0		
Maketu - - -	Town point - - -	37 43 0	176 28 30		
Whale I. or Motu-hora	Highest peak (1,167 feet)	37 50 15	176 59 30		
Opotiki river - -	Mission house - -	38 0 0	177 17 30	7 0	7 springs
White island - -	Summit (863 feet) -	37 30 0	177 11 45	7 30	
Mount Edgcumbe -	East summit (2,575 feet)	38 6 0	176 45 0		
Te-kaha point - -	Outer extreme - -	37 43 0	177 41 45	6 30	9 ”
Runaway cape -	Extreme - - -	37 30 45	178 0 30	9 16	7 ”
Hicks bay - -	Matakawa (north point)	37 32 20	178 21 15	9 0	7 ”
East cape - -	East islet (420 feet) -	37 40 0	178 36 5	8 55	7 ”
Open bay - -	North point - - -	37 58 20	178 28 10		
Tolago bay - -	Motu-heka islet - -	38 20 50	178 21 10	8 50	
Gable-end foreland	The White gable - -	38 31 45	178 18 20	8 0	
Ariel rocks - -	Centre of reef - -	38 43 40	178 18 30	8 0	
Poverty bay - -	Young Nick's head - -	38 45 0	177 59 25	6 5	5 to 7
Mahia peninsula -	Table cape (extreme) -	39 6 0	178 1 0		

Place.	Particular Spot.	Latitude. South.	Longitude. East.	Tides. H.W. F. & C.	Tides. Rise.
NORTH ISLAND—*continued.*					
		° ′ ″	° ′ ″	h. m.	feet.
Mahia peninsula -	Portland island lighthouse	39 18 0	177 53 5	7 45	
Hawke bay - -	Ahuriri harbr. lighthouse	39 28 30	176 55 10	7 50	3 springs
„ „ - -	Long point anchorage, Moemoto head - -	39 8 0	177 51 30	6 0	4 to 5
Cape Kidnappers -	Extreme - - -	39 38 0	177 7 40		
Cape Turnagain -	Extreme - - -	40 29 30	176 38 30	7 0	
Castle point - -	Extreme - - -	40 54 30	176 14 20		
Flat point - -	Extreme - - -	41 15 10	175 58 30		
Cape Palliser - -	Extreme - - -	41 37 30	175 17 20	6 0	
Taourakira head -	Extreme - - -	41 26 20	174 56 15		
Port Nicholson -	Pencarrow lighthouse -	41 21 40	174 52 0		
„ „ -	Pipitea point - - -	41 16 40	174 47 53	4 30	2½ to 5
„ „ -	Observatory* - - -	41 16 57	174 47 10		
Cape Terawiti -	Extreme - - -	41 17 15	174 38 15		
Mana island - -	Anchorage point - -	41 5 51	174 48 5	7 0	6 to 8
Kapiti island - -	Long point - - -	40 50 0	174 58 25		
„ „ - -	Mahew islet - - -	40 53 30	174 55 15	9 0	6 to 8
Manawatu river -	North entrance point -	40 27 20	175 14 20	9 50	6 to 8
Rangitiki river -	North entrance - -	40 17 40	175 14 45		
Wanganui river -	North head - - -	39 57 0	175 0 40	10 15	6 to 8
Waimate pah - -	Summit - - - -	39 35 40	174 10 0		
Cape Egmont - -	Lighthouse - - -	39 17 0	173 46 10	9 30	
Mount Egmont -	Summit (8,270 feet) -	39 18 0	174 4 55		
New Plymouth -	Flag-staff - - -	39 3 35	174 5 31	9 30	9 to 12
Mokau river - -	Entrance - - -	38 42 20	174 38 45		
Albatross point -	North extreme - -	38 6 10	174 43 30		
Kawhia harbour -	South head - - -	38 4 50	174 49 0	9 30	12 springs
Gannet island - -	Summit (70 feet) - -	37 57 0	174 35 0		
Aotea harbour -	South head - - -	37 59 35	174 51 0	10 0	9½ to 12
Whaingaroa harbour	South entrance point -	37 46 22	174 53 15	9 50	12 „
Waikato river - -	White Shell summit -	37 24 0	174 47 25	9 30	9 to 12
Manukau harbour	Paratutai (North head) flag-staff - - -	37 3 0	174 32 10	9 30	10 to 13
„ „ -	Onehunga (South point) -	36 56 15	174 48 0	10 50	5 to 14
Kaipara harbour -	South head (Okaka) -	36 25 10	174 14 33	10 55	8 to 10
„ „ -	North Sand head - -	36 22 39	174 7 30		
„ „	Watering place, Wairoa branch - - -	36 18 35	174 10 48	10 50	8 to 11

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the Wellington Observatory in the triangulation of the province of
1872 was 174° 48′ 50″ E.

Place.	Particular Spot.	Latitude. South.	Longitude. East.	Tides.	
				H.W. F. & C.	Rise.
NORTH ISLAND—*continued*.					
		° ′ ″	° ′ ″	h. m.	feet.
Monganui bluff	The bluff (2,046 feet)	35 46 20	173 34 42	9 45	
Hokianga river	Flag-staff at entrance	35 32 5	173 22 55	9 45	10springs
„ „	Upper Mission station	35 21 30	173 33 20	10 15	7 to 10
Wangape	North head	35 22 30	173 18 55	9 10	
Herekino	South point	35 18 10	173 11 5	9 0	
Reef point	Extreme	35 10 30	173 5 30	8 45	7 „
MIDDLE ISLAND.					
Cape Campbell	Lighthouse	41 44 0	174 18 10	6 0	6 to 8
Waipapa point	Extreme	42 10 15	173 58 30		
Kaikora peninsula	East head	42 26 30	173 44 0	5 0	4 to 6
Amuri bluff	Extreme of bluff	42 34 0	173 32 30		
Waiau-ua river	Entrance	42 47 0	173 23 40	4 10	3 to 5
Sail rock	Centre	42 58 15	173 14 30		
Pegasus bay	Motu-nau, or Table island	43 4 0	173 6 0	4 0	
„ „	Double corner (landing place)	43 8 25	172 50 0		
Port Lyttelton, or Victoria	Custom house	43 36 42	172 44 17	4 20	5½ to 7½
Pigeon bay	Settlement cove	43 40 41	172 54 8		
Banks peninsula	East head	43 46 0	173 9 0	3 45	
Akaroa harbour	Observation head	43 49 34	172 58 17	3 24	6 to 8
Hakatere, or Ashburton river	North entrance point	44 4 50	171 49 30		
Timaru	Lighthouse	44 23 30	171 18 30		
Waihao river	Entrance	44 47 15	171 12 55		
Waitangi river	North entrance head	44 54 50	171 12 10		
Cape Wanbrow	Lighthouse	45 7 20	171 1 20		
Moerangi bay	Look-out bluff	45 16 15	170 53 50		
„ „	Lighthouse, Whaler's Home point	45 24 10	170 53 30	3 0	
Waikouaiti bay	Jones head	45 37 30	170 43 0		
Otago harbour	Tairoa head lighthouse	45 46 55	170 44 58	2 50	5 to 7
„ „	Koputai bay, South point	45 49 18	170 39 0	3 30	
Cape Saunders	Lighthouse	45 53 30	170 45 0	2 45	
Taieri island	East point	46 4 0	170 14 25		

Place.	Particular Spot.	Latitude.	Longitude.	Tides.	
		South.	East.	H.W. F.&C.	Rise.
	MIDDLE ISLAND—*continued.*				
		° ′ ″	° ′ ″	h. m.	feet.
Quoin point - -	Extreme - - - -	46 9 35	170 11 30		
Molyneux bay -	Landing place - -	46 24 5	169 48 49	3 0	6 to 8
Nugget point - -	Lighthouse - - -	46 27 10	169 51 0		
Long point - -	Extreme of cliffs (275 feet)	46 35 15	169 36 0		
Chaslands mistake -	Extreme of point - -	46 39 0	169 21 30		
Brothers point -	Outer islet - - -	46 40 15	169 13 20		
Slope point - -	Extreme - - - -	46 41 0	169 3 0		
Ruapuke island -	Observation bluff -	46 46 42	168 33 55	1 0	6 to 8
Awarua, or Bluff harbour - -	Point west of pier - -	46 36 17	168 21 55	1 18	6 to 8
New river (*Orete*) -	Bombay rock - - -	46 31 10	168 17 25	12 10	4 to 8
Centre island - -	South end (lighthouse) -	46 28 30	167 52 35	12 15	6 to 8
Tewaewae bay -	Pahia point - - -	46 20 40	167 43 15		
" " - -	Mid-bay reef - - -	46 16 30	167 29 0		
" " - -	Sandhill point - -	46 15 45	167 22 20		
Solander island -	Summit (1,100 feet) -	46 36 0	166 55 0		
Green islets - -	Outer islet - - -	46 14 50	166 48 20		
Windsor point -	Extreme - - -	46 12 40	166 40 0		
Preservation inlet -	Cuttle cove - - -	46 4 20	166 40 38	11 20	4 to 8
Table rock - -	Centre (20 feet high) -	46 6 10	166 31 55		
Chalky inlet - -	North port, entrance -	45 59 10	166 36 20	11 5	4 to 8
Cape Providence -	Sugarloaf - - -	46 1 10	166 29 15	11 15	
West cape - -	Extreme - - -	45 54 50	166 26 45		
Dusky sound, or bay	Five Fingers point - -	45 44 45	166 27 45	11 15	6 to 10
" "	Duck cove, Observation rock	45 43 42	166 39 37	10 50	6 to 10
Breaksea island -	North-east point - -	45 34 45	166 38 45	11 15	
Daggs sound - -	Observ^y head, North arm	45 23 7	166 52 30	11 30	6 to 8
Doubtful inlet - -	Febrero point (Hare's ears)	45 16 45	166 50 15		
Thompson sound -	Deas cove - - -	45 11 43	166 58 10	11 30	6 to 8
Nancy sound - -	Heel cove - - -	45 11 10	167 6 10		
Caswell sound - -	Green point islet - -	45 1 43	167 18 15		
George sound -	Anchorage cove, North shore - - -	44 55 20	167 26 50		
Bligh sound - -	Bounty cove - - -	44 52 56	167 32 20	10 45	6 to 8
Milford sound - -	Anita bay - - -	44 35 0	167 47 10		
" " - -	Freshwater basin - -	44 40 20	167 55 41	9 15	6 to 8

Place.	Particular Spot.	Latitude. South.	Longitude. East.	Tides.	
				H.W. F.&C.	Rise.
	MIDDLE ISLAND—*continued.*				
		° ′ ″	° ′ ″	h. m.	feet.
Awarua river -	Entrance - - -	44 18 0	168 4 0 by chart.		
Cascade point -	North extreme - -	44 0 30	168 22 30		
Jackson bay -	Huts in S.W. corner -	43 58 35	168 37 41		
Open bay islets	S.W. islet—centre - -	43 51 40	168 53 45		
Arnott point -	Extreme - - -	43 43 0	169 13 30		
Bruce bay -	Anchorage - - -	43 35 0	169 37 0		
Mount Cook -	Highest peak (12,349) -	43 33 30	170 12 10		
Okarito lagoon	Entrance - - -	43 12 50	170 11 40	11 40	9 spring
Abut head -	Extreme - - -	43 6 0	170 17 0		
Bold head -	Extreme - - -	42 56 0	170 42 30		
Hokitika river	Entrance - - -	42 43 10	170 58 20	9 39	8½ to 9 „
Grey river -	Entrance - - -	42 26 20	171 12 50	10 15	
Perpendicular point -	Centre cliff - - -	42 7 45	171 16 45		
Cape Foulwind	Lighthouse - - -	41 45 40	171 28 40	10 25	7½ to 10
„ „ -	Three Steeples (northern)	41 44 30	171 29 10		
Buller river - (*Kawatiri.*)	Entrance - - -	41 45 30	171 36 30		
Rocks point -	Extreme - - -	40 58 30	172 4 30		
Wanganui inlet	Entrance (South head) -	40 35 0	172 33 0		
Cape Farewell	Extreme - - -	40 29 50	172 42 0	9 0	10 to 14
Farewell spit -	Bush end, extreme of spit	40 33 20	173 2 0		
Massacre bay -	Tasman corner, Abel head	40 31 52	172 45 10	8 45	9 to 13
„ „ -	Motu-pipi river, west ent.	40 50 5	172 51 38	9 50	10 to 14
Astrolabe road	Adele island, N.E. point -	40 58 55	173 5 20		
Nelson haven -	Magazine on Boulder bank	41 15 35	173 16 58	9 50	10 to 14
Croisilles harbour	Shingle point on N. shore	41 3 15	173 43 20		
Current basin -	Sandy bay, Cross point -	40 56 20	173 52 15	10 0	5 to 12
Stephens island	North end - - -	40 40 0	174 1 10		
D'Urville island	Port Hardy: East arm Wooding point - -	40 46 35	173 55 0	9 55	12
„ „ -	Beach, Rangitoto road -	40 47 50	173 58 10		
Pelorus sound	Sentinel rock, off entrance	40 53 5	174 9 40	9 35	7 to 11
„ „ -	Ohingaroa bay—beach -	41 15 22	173 53 38	10 0	7 to 11
„ „ -	Kopi bay (north point of port Ligar).	40 55 12	173 59 45	9 35	
Guards bay -	Titirangi bay, cliff at head	41 1 10	174 9 30		
Cape Lambert	Extreme - - -	40 59 15	174 15 0		
Port Gore -	Head of Melville cove -	41 1 55	174 12 18	9 0	6 to 8

Place.	Particular Spot.	Latitude. South.	Longitude. East.	Tides.	
				H.W. F. & C.	Rise.
		MIDDLE ISLAND—*continued.*			
		° ′ ″	° ′ ″	h. m.	feet.
Cape Jackson - -	Extreme - - -	40 59 40	174 20 0		
Queen Charlotte sound - -	Motuara, South summit -	41 5 48	174 17 30	8 50	6 to 8
Tory channel - -	White rocks, Jackson bay	41 12 45	174 18 20	8 15	6 to 8
Brothers islets -	Lighthouse, North islet (235 feet).	41 6 25	174 27 15		
Wellington head -	Summit (2,190 feet) -	41 11 15	174 23 0		
Port Underwood -	Bell's cove, Flag point -	41 20 28	174 9 20	6 10	6 to 8
Wairau river - -	Entrance, north side -	41 30 10	174 4 50		
White bluff - -	Summit (890 feet) -	41 34 30	174 10 10		
		SOUTH, OR STEWART ISLAND.			
Black Rock point -	Extreme - - -	46 41 30	167 53 45		
Port William - -	Howell's house - -	46 50 30	168 6 30	12 45	6 to 8
Paterson inlet -	Glory cove, at head of -	46 58 30	168 10 50	1 10	6 to 8
Port Adventure -	White beach, South end -	47 3 52	168 11 53	12 20	6 to 8
Lords river - -	Cove within S. entrance point.	47 7 11	168 9 34	1 20	6 to 8
Port Pegasus - -	Observation cove - -	47 11 40	167 41 47	11 50	6 to 8
S.W. cape - -	S.W. extreme, Stewart island.	47 17 0	167 30 15	12 0	7 springs
Traps rocks - -	North reef, N.W. rock (5 ft.)	47 22 15	167 55 20		
" " - -	South reef, centre - -	47 33 0	167 52 45	12 0	
Wedge island - -	Centre - - - -	47 13 30	167 21 30	12 0	
Mason bay - -	North Ernest island, South cove.	46 57 9	167 42 5	11 10	6 to 8
Codfish island - -	N.W. extreme, High rocks	46 45 45	167 37 45		
		SNARES ISLAND.			
SNARES ISLANDS -	S.W. island - - -	48 6 43	166 28 40		

MAGNETIC OBSERVATIONS.

Place.	Year.	Variation. East.	Dip.	Year.
North Island.				
		° ′	° ″	
Three Kings islands - - - -	1883	13 0		
Parenga-renga harbour - - - -	—	13 5		
Cape Kara-kara - - - -	—	13 10		
Wangaroa harbour - - - -	—	13 12	58 27·54	1851
Bay of Islands - - - - -	—	13 15		
Wangaruru harbour - - - -	—	13 23		
Wangari harbour - - - -	—	13 30		
Great Barrier island - - - -	—	13 35		
Auckland harbour - - - -	—	13 45		
Tauranga harbour - - - -	—	13 52		
Maketu - - - - -	—	13 55		
Motu-hora - - - - -	—	13 55		
Opotiki - - - - - -	—	13 58		
Cape Runaway - - - - -	—	13 45		
Hicks bay - - - - -	—	13 45	59 40·8	1854
Poverty bay - - - - -	—	14 10		
Ahuriri, or port Napier - - -	—	14 28		
Port Nicholson - - - -	—	15 0	64 52·0	1850
„ „ - - - - - -	—	—	65 14	1874
Mana island - - - -	—	14 58		
Kapiti island - - - - -	—	14 50		
New Plymouth - - - - -	—	14 20		
Manukau harbour - - - -	—	13 50		
Hokianga river - - - -	—	13 20		
Cape Maria Van Diemen - - -	—	13 0		
Middle Island.				
Port Underwood - - - -	1883	15 0	65 12	1851
Queen Charlotte sound—Motuara island -	—	15 0	64 48	1850
Pelorus sound - - - - -	—	15 0	64 58	1853
Nelson haven - - - - -	—	14 58	64 04	1850
Port Lyttelton or Victoria - - -	—	15 42		
Akaroa harbour - - - -	—	15 45	66 17	1850
Otago harbour - - - - -	—	16 20	68 54	1850
Bluff harbour - - - - -	—	16 25		

Place.	Year.	Variation. East.	Dip.	Year.
MIDDLE ISLAND—*continued.*				
		° ′	° ′	
Ruapuke island - - - -	1883	16 28		
Preservation inlet - - - -	—	15 55		
Chalky inlet - - - - -	—	15 55		
Dusky sound, or bay - - - -	—	15 50	69 47	1851
Thompson sound - - - -	—	15 45		
Bligh sound - - - - -	—	15 42		
Milford sound - - - - -	—	15 40	68 26	1851
Jackson bay - - - - -	—	15 30		
Massacre bay - - - - -	—	14 45		
SOUTH ISLAND.				
Port William - - - - -	1883	16 25	70 23	1850
Port Adventure - - - -	—	16 30	70 22	1850
Port Pegasus - - - - -	—	16 33	70 39	1850
Mason bay - - - - -	—	16 28		
SNARES ISLANDS - - - -	—	16 35		

INDEX.

Page
Abbott passage - - - 291
Abercrombie port - - - 90
Abut head - - - 333, 335
Accord point - - - 76
Acheron anchorage, port Pegasus - 297
——— passage - - - 319
Adams island - - 360, 369
——— strait - - - 369
Adderley head - - - 245
Adele island - - - 195
Admiralty bay - - - 184
Adolphe point - - - 195
Adventure port - - - 294
Aha-aha reef - - 27, 28
Ahaipara roadstead - - - 202
Ahuriri bluff, port Napier - - 128
——— harbour or port Napier - 128
———, lights - - 129
———, tides - - 130
——— roadstead - - 129 to 131
——— rock, Waikouaiti bay - 259
Aiguilles or Needles point - - 90
Akaloa bay, Banks peninsula - 250
———, Guards bay - - 179
Akaroa harbour - - 5, 251 to 258
———, light - - 252
———, tides - - 253
Akers point - - - 291
Alapawa island - - - 170
———, beacon lights - 171
Albatross point - - - 231
Albert channel - - 54, 58
——— mount, and signal station - 146
——— land settlement - - 216
——— rocks - - - 38
——— shoal, Kawau island - 79
———, marks for clearing - 79
Alderman islands - - 101, 118
Alison point - - - 376
Alligator head - - 175, 179
Allround peak - - - 322
Amazon cove - - 328

Page
Amuri bluff - - - 239
Anaura island - - - 119
Anchor island and harbour - - 314
Anchorage cove, George sound - 327
———, South port - 312
——— island - - - 296
Anglem mount - - 277, 289
——— point - - - 292
Anita bay anchorage - - 330
Ann point, Whaingaroa - - 227
Annoyance point - - - 71
Antipodes islands - - 373, 374
Aorèrè river - - 196, 198
Aotea harbour - - 228, 229
———, bar - - - 229
———, directions - - 229
———, tides - - 230
Apua channel - - - 183
Arabella rock - - - 138
Arahura river - - - 337
Arapaua river - - 211, 215
Archway islet - - - 344
Area of country - - - 1
Arid island - - - 94
Ariel rocks and clearing marks - 124
Arnott point - - - 334
Aroha mountain - - - 6
Arrow rock, Nelson haven - - 191
———, Wangaroa bay - 42
Arrowsmith bay - - - 171
Arthur mount - - - 189
Astrolabe reef and clearing marks - 115
——— road - - - 195
Auckland province and town - 5, 6
——— harbour - - 23 to 26
———, anchorage - 25
——— outside 27
———, as a coaling station - - 26
———, directions - 24
———, docks - - 26
———, lights - - 25

Page
Auckland harbour, tides - - 26
——— islands - - 360 to 370
———, climate of - 364
———, general description 360 to 364
———, west coast - 365
——— rock, Hawke bay - 129
Avon or Opawaha river - 10, 248
Awaiti island - - - 182
Awanui river (*Rangaounau*) 36, 37
———, bay of Plenty - 108
Awaote-atua river - - - 106
Awarua bay - - - 194
——— point and rocks off - 331
——— river - - - 331
Awash rocks - - - 172
Awatere river - - - 111

Baleine point - - - 250
———, rock off, and beacon - 250
Balleny reef - - - 306
Banks peninsula - - 244 to 253
———, soundings off 244, 251, 253
Barclay rock - - - 291
Bare island (*Motu-kura*) - - 133
Baring head - - - 187
Barn bay - - - - 332
Barret bay, Tory channel - - 171
——— reef, port Nicholson - - 189
———, New Plymouth - - 165
Barrier island, great - 89 to 94
———, little - - 20
——— cape - - 93, 95
Bastion rocks and beacon - - 25
Bateman island - - - 56
Batley township - - - 215
Bauza island - - - 322
Baxter reef - - - - 238
Bay of Islands - - 44 to 60
———, western portion 44 to 53
———, eastern portion 53 to 60
———, coal mines - - 51
———, entering from southward - - 60
———, tides - 49, 60
———, winds and weather - 59
Bay of Plenty - - 100 to 110
———, islands and rocks in - - 113 to 117
———, soundings - - 108
Bay of Plenty, tides - 109
Bean rocks and light - 23, 24
Beehive islet - - - 78
Bell's cove - - - - 169
Bench island - - 291, 292
Bend point - - - - 325
Benmore mountain - - - 236
Bertier rock - - 386
Big bay - - - 331
——— river (*Waiau-toa*), Middle island 236
——— (*Patupo*), Foveaux strait - 288
Bird island, Foveaux strait - - 275
——— rock, bay of Islands - - 59
———, great Barrier island - 90
———, port Tofino - - 93
Bishop and Clerk - - - 387
Black head, anchorage - - 133
———, West coast, Middle island - - 266
——— reef point anchorage - - 127
——— rocks, bay of Islands - 45
———, Wangaruru harbour - 63
———, cape Palliser - - 135
———, port Pegasus - - 296
——— point - - - 300
Blackney point - - - 37
Blanche channel - - 78 to 80
——— rock, Auckland islands - 369
Bland bay - - - - 62
Blanket bay - - - 323
Blenheim - - - - 9
Bligh sound - - 328, 329
———, small craft anchorage - 328
Blind bay - - - 188 to 196
——— currents - - - 196
——— winds - - - 189
Blueskin bay - - - 259
Bluff harbour (*Awarua*) - 280 to 283
———, anchorage - - 283
———, buoys - - 281
———, directions for entering 282
———, hill - - - 279
———, leading beacons - 281
———, light-vessel - - 281
———, plains - - 3
———, signal stations - 280
———, tides - - - 283
Boat group - - - 299
——— harbour, Campbell island - 373
——— rock - - - - 252
———, Caswell sound - - 327

Page
Boldhead (*Paramata*) - - 386
Bolton hole anchorage - - 198
Bombay rock - - - 285
Bon Accord harbour - - 76
———, tides - - 78
Bone bay - - - - 251
Boulder bank, Nelson haven - 190
———, light - - - 191
———, magazine - - 190
Bounty haven - - - 328
——— islands - - 374, 375
———, soundings off - 375
Bowen falls - - - - 330
Bowler reef - - - - 167
Bradshaw sound - - - 324
Brampton or Favourite bank - 48
———, marks to clear - 48
Breaker point - - - 312
Breaksea island - - - 320
——— islands, Stewart island - 295
——— isles, Foveaux strait - 275
——— sound - - - 320
———, best anchorage in - 321
Bream head (*Tewara*) - 18, 67
——— islet and rock - - 67
——— tail (*Papai-outou*) - 67, 73
Brenda bay - - - - 169
Brett cape - - 18, 53, 59, 60
Bridge, the - - - - 150
Brig rock - - - - 330
Bristow rock - - 364, 365
Britomart point wharf - - 25
Broad passage - - - 296
Broke-adrift passage - - 306
Brooke or Greville harbour - - 186
Brothers islands, Cook strait - 172
———, light - - 173
——— islets, Stewart island - 298
——— point - - - 268
——— rocks, bay of Islands - 46
Bruce bay and anchorage - 4, 385
——— reef - - - - 295
Buckland peak - - - 340
Bull rock - - - 125
Bullen cove - - - - 238
Buller river (*Kawatira*) - 4, 341
———, directions, &c. - - 342
Burgess islet - - - 19
Burke's pass - - - 254
Burnett mount - 197, 199, 344
Burial bay - - - 190

Page
Burial cove - - - 297
Busby head - - - 68
Bush-end point, light - - 197

Cabbage bay - - - 85
Calliope bank - - - 68
——— bay - - - 68
——— point, Auckland - - 26
Camel mount - - 35, 36
Campbell cape, light - 167, 235
———, tides - - 167
——— island - - 370 to 373
Campbelltown - - - 280
Canterbury plains - - - 242
——— province - - 5, 10
——— rock - - - 180
Cape Barrier - - 93, 95
——— Brett - - 18, 53, 59, 60
——— Campbell - - 167, 235
——— Colville - - 27, 83, 94
——— Egmont - - - 160
——— Farewell - - 196, 344
——— Foulwind - - - 340
——— Fournièr - - 381, 385
——— Gable or Gable-end foreland - 121
——— Jackson - - - 174
——— Kara-kara - - 35, 36
——— Kidnappers - - - 132
——— Koamoroo - - 172, 174
——— Lambert - - 175, 179
——— Maria Van Diemen - 17, 33, 201
——— Palliser - - 135, 167
——— Providence - - - 310
——— Reinga - - - 34
——— Runaway - - - 109
——— Saunders - - 260, 266
——— Soucis - - - 189
——— Terawiti - - - 148
——— Turnagain (*Te-poroporo*) - 133
——— Wiwiki - - - 44
——— Young - - 376, 381
Capstan rock, bay of Islands - 55
———, S.E. coast, North island 133
Carnley harbour, west entrance - 366
———, east entrance - 369
Caroline bay - - - 276
Carter passage - - - 292
Cascade basin - - - 309
——— cove - - - 316

Page

Cascade point - - - 332
Castle hill - - - - 88
—— island *Ngatutu*) - - 100
—— island, Chatham islands - 386
—— point - - - 134
Castor peaks - - - 189
Caswell sound - - - 326
Catherine bay - - - 90
Catlin (Newhaven) river - - 268
Cavalli islands - - - 43
——— passage - - - 43
————, rock in centre of - 43
————, tides - - 43
Cave point - - - - 300
—— rock, Avon river - - 243
Cavern head, Akaroa harbour - 252
————, Preservation inlet - 307
Centre island, light - - - 286
————, reefs - - - 287
Chaffers passage - - - 139
Chalky (Dark cloud) inlet - 310 to 314
——————, eastern passage - 311
——————, western passage - 311
——————, tides - 314
——— island - - - 310
Chalmers port, docks, &c. - - 265
————, time-ball - - 265
Chambres inlet - - - 370
Channel islet (*Takoupo*) - 27, 31, 95
——— point - - - 187
Chapman rocks - - - 241
Charles cove - - - 95
——— sound - - - 325
Clarke island (*Karaka*) - - 29
——— islet - - - - 101
Chasland's mistake - - 267, 268
Chatham islands - 5, 376 to 386
————, from the westward - 382
Chetwode islands - - - 180
Cheviot hills - - - 239
Chicken islands (*Moro-tiri*) - 18
Chicot rocks - - - 186
Christchurch city - 9, 10, 243, 246, 249
Clatchie point - - - 384
Clendon cove - - - 56
Cliff island - - - - 92
Clifford bay - - - 168
Cliffy head - - - - 336
Clio rock, Bligh sound - - 329
Cloudy bay - - - - 168

Page

Clutha river (*Matau*) - - 267
Coal island - - - - 306
—— mines, bay of Islands - - 51
————, Wangari - - 73
—— point (*Kohau*), Parenga-renga harbour - - - 34
—— river - - - - 321
Coaling road - - - 198
Coast, Abut head to the north-east - 336
——, Akaroa to the westward - 253
——, Arnott point to Abut head - 334
——, Awarua point to Cascade point - - - 331
——, Bligh sound to Milford sound 329
——, Bream tail to Rodney point - 73
——, cape Campbell to Kaikora peninsula - - 235
———— Colville to Coromandel harbour - - 84
———— Foulwind to Rocks point 341
———— Kidnappers to cape Turnagain - - 132
———— Maria Van Diemen to cape Brett - - 33
———— Maria Van Diemen to Reef point - - 202
———— Terawiti to Porirua harbour - - 149
———— Turnagain to Castle point - - 133
——, Deadman point to river Thames - - - 86
——, Durham point to Evêque point 385
——, East cape to Open bay - 117
——, Flat point to cape Palliser - 134
——, Gable-end foreland to Poverty bay - - - 121
——, Great Barrier island, west - 90
——————, east - 94
——, Hicks bay to East cape - 111
——, Kaipara to Manukau harbour 217
——, Mahia peninsula to cape Palliser - - - 127
——, Manukau to Waikato river - 225
——, Mercury bay to Tauranga harbour - - - 100
—— northward of Jackson bay - 333
———————— Kapiti island - 152
———————— Porirua harbour 150
———————— Terawiti cape - 149
——, Nugget point to Foveaux strait - - - 267
——, Open bay to Tolago bay - 118
——, Opunake bay, to New Plymouth - - - 160

Page

Coast, Otago harbour to Nugget point - - - 266
——, Poverty bay to Mahia peninsula - - 123, 125
——, Robertson point to Tory channel - - - 170
—— southward of Flaxburn river - 286
—————— Kawhia harbour 231, 232
—————— Maurhangi harbour - - 81
—————— Wangamomoo harbour - 61
——, Stewart island, S.W. side - 298
——, Tauranga harbour to Kaituna river - - - 105
——, Tewaewae bay to Puysegur point - - - 288
——, Timaru to Waitangi river - 256
——, Waikato to Whaingaroa harbour - - - 227
——, Waitangi river to Look-out bluff - - - 257
——, Wanganui to cape Egmont - 156
—— westward of New river - 286
Cocked hat island - - 45, 46
Cockle bay - - - - 178
Codfish island and anchorage - 299
Collinet point - - - 187
Collingwood township - - 9
Colonial head - - - 324
Colt head - - - - 308
Columbia reef - - - 33
Colville cape - - 27, 83, 94
Commerce of New Zealand - - 5
Common head - - - 323
Cone rock, Gooch bay - - 238
————, Wangaroa bay - - 40
Conical island - - - 189
Cook mount - - 3, 329, 334
—— rock (Cook strait) - - 173
————, clearing marks - - 178
—— strait, north side - 136 to 166
————, south side - 167 to 200
————, dangers - - 172, 173
————, entering from westward - 146
——————— south-westward - 199
————, overfalls - - 149
————, ports of refuge - - 146
————, prevailing winds - 146
————, soundings - - 167
————, telegraph cable - - 146

Page

Cook strait, tides - 144, 147, 148, 149
Cook's bay - - - - 97
——— head - - - 266
——— South cape - - - 297
——— watering cove - - 120
Cooper island, Dusky sound - 316
—————, Foveaux strait - 292
—————, Queen Charlotte sound - 176
Cording islets - - 305
Cormorant cove - - 317
Coromandel harbour (*Waihou*) - 83
Cosgrave island - - - 268
Cossack rock - - - 373
Courtenay river (*Waimakariri*) - 242
Crayfish island, Dusky sound - 316
——— islet, Preservation inlet - 308
—————, small craft anchorage - 308
Croisilles harbour - - - 189
——————, tides - - 190
Crooked arm - - - 323
Cuba channel - - - 382
Cunaris sound - - - 313
Curious cliff - - - 344
Current, cape Campbell to Banks peninsula - - 244
————— Saunders to Nugget point - - 267
———, Foveaux strait - - 272
——— off Banks peninsula - 251
——— on S.W. coast, Middle island 333
———, Three Kings islands - 17
——— basin, and French pass 186 to 188
Cuttle cove - - - - 307
Cuvier island - - 27, 95

Dacre bay - - - - 171
Daggs sound - - - 321
Danger reef - - - - 259
——— rock - - - 62
Darch point - - - 69
Dargaville township - - 215
David rocks - - 27, 28
Davidson rocks - - - 238
Deadman point - - - 85
Deas cove, Thompson sound - 324
————, tides - - - 325
—— head, Auckland islands - 367
Deep cove - - - - 323
Deep-water cove - - - 59
Depôt point - - - - 23
Detention cov - - - 318

Page
Dieffenbach mount (*Wakapai*) - 382
—— point - - - 171
Disappointment island - - 365
Disaster point - - - 169
Dispute cove - - - 77
Dog island, sunken rocks, light - 283
—— point - - - - 326
Double corner, Pegasus bay - 242
—— mount - - - 189
Doubtful inlet - - 322 to 324
——, anchorages - - 323
—— rock - - - 287
Doubtless bay - - - 38
Drift-round head - - - 189
Driver rock - - - 264
Drury township - - - 6
Duck cove, danger (Dusky sound) - 318
——, tides - - - 318
Dundas islet - - - 368
Dunedin city - - 5, 262
Duppa mount - - - 189
Durham point - - - 385
D'Urville island - - - 184
—— rocks - - 27, 28, 29
Dusky sound or bay - 314 to 319
——, Cook's anchorages in 315, 317, 318, 319
——, directions for entering 314, 315
——, tides - - - 318

Earthquakes - - - 8
East bay, Alapawa island - - 176
—— cape - - - - 111
——, approaching coast south of - - - 126
—— islet - - - 112
——, anchorage - - 112
——, shoal patches off - - 112
——, tides and winds - - 112
—— head of Stewart island - 294
Eastern reef (Three rocks) - - 386
Easy port - - - - 298
Eclipse rock - - - 117
—— shoal - - - 77
Edgcumbe mount - - - 106
Edwardson sound - - - 313
Egmont cape - - - 160
——, light - - - 160
—— mount - - - 161
Eleanor island - 326

Page
Elizabeth island - - - 323
—— reef - - - 65
Elliott mount - - - 161
Emerald island - - - 387
Emo-kawa hill - - - 382
Endeavour inlet - - - 177
Enderby island, anchorage - - 366
Entrance island - - - 294
—— islet - - - 325
Entry anchorage - - - 151
—— island - - 315, 320
Erebus cove - - - 367
Ernest isles - - - 299
Erskine bay - - - 247
Escape reefs - - - 287
Evans bay - - 139, 141
——, patent slip - - 141
—— islet or sugarloaf - - 151
—— point - - - - 383
Evening point - - - 329
Evêque point - - - 385
Ewhatu rock, Aotea - - 229
Ewing island - - - 368

Facile harbour, danger - - 317
Fairchild reef - - - 75
—— shoal - - - 274
Fairway reef - - - 38
Falcon rock - - - - 341
False head, Great Barrier island - 91
——, Wangaroa harbour - 40
—— Hokianga (*Herekino*) - - 202
—— islet - - - - 268
Fanal islands - - 19, 89
Fancy group - - - 292
—— rock - - - - 386
Farewell cape - - - 196
——, light - - - 197
—— spit - - 197, 344
——, marks to clear - 199
——, tides off - 200, 345
Farmer rock - - - 17
Favourite or Brampton bank - 48
Fife rock - - - 275, 277
Figure-of-eight islands, anchorage 366, 369
Finger peak - - - 289
First arm - - - - 323
Fish point - - - 77, 79
—— reef, E. coast, Middle island - 258
——, Foveaux strait - - 287
—— rock - - - - 291

Page
Fisherman road and island - - 196
Fishing or Middle bank - - 85
——— bay - - - - 308
Fitzroy bay, Pelorus sound - - 183
——— anchorage, port Nicholson 138, 145
——— port - - - - 91
Five Fingers point - - - 314
——— range - - - 340
——— rocks - - - 340
Flat head - - - 38, 40
—— island - - - - 42
—— point, dangers - - - 134
—— rock, beacon - - 20, 77
Flaxburn river - - - 235
———, anchorage off - 235
Fleet rocks - - - - 185
Flurry head - - - - 323
Fly bank - - - - 177
Forsyth bay - - - 182
——— island - - - 179
Fort island - - - - 386
Fossil cliff - - - - 198
Foulwind cape, anchorage - - 340
———, extensive bight east of 341
———, light - - 341
Four islets - - - - 65
Fournièr cape - - 381, 385
Foveaux strait - - 271 to 278
———, current - - 272
———, dangers on north coast 286, 287, 288
———, eastern entrance - 276
———, harbours - 272, 273
———, tides - 276, 278, 300
———, western entrance - 272
———, winds, &c. - - 278
Fox point, Parenga-renga harbour - 34
———, Milford sound - - 330
Francis mount - - - 137
Fraser peaks - - - 296
French pass, and Current basin 186 to 188
French's island - - - 368
Freshwater basin, Milford sound - 330
———, tides - - 331
Frith of Thames - - - 83
Furneaux mount - - - 179
Fyffe cove, directions - - 237

Gable-end foreland - - 121
Gaer arm - - - - 325

Page
Galakek island - - - 44
Galatea channel, Kaipara - - 212
Gannet island - - - 228
Gaol passage - - - 322
Garden isles - - - 312
Garrard rock - - - 317
George sound - - 327, 328
Gibraltar rock - - - 150
Gibson point - - - 241
Gilbert islands - - - 320
Gisborne - - - - 123
Glory cove - - - - 293
Godley head, light (port Lyttelton) - 246
Gold exports - - - 12
Gooch bay - - - - 238
Goose cove - - - - 317
Gordon point and reef - - 383
Gore bay and anchorage - 240 to 242
—— port - - - - 178
Government island - - - 38
Governors pass - - - 90
Grahamstown, light - - 86
Granger inlet - - - 370
Granville point - - - 35
Great Barrier island (*Otea*) 89 to 94
———, copper mine - 90
—— Exhibition bay - - 35
—— island - - - 313
—— Mercury island - - 96
Green island - - - 273
—— islet, Auckland islands - 368
———, west coast, Middle island 266
—— islets - - - - 288
Greville or Brooke harbour - - 186
Greymouth town - - 5, 339
Grey river (*Mawhera*) - 5, 338
———, anchorage off - - 339
———, beacons, lights, tides - 339
Griffith inlet - - - 370
Grove point - - - - 63
Groznoz mount - - - 322
Guards bay - - - - 179
Guide rock - - - - 299
Guiding Star rock - - - 285
Guilbert point - - - 195
Gulches head - - - 306
———, sunken rock off - 306
Gull point - - - - 82
—— rock, S.E. coast, Middle island 266
———, Stewart island - - 290

Page
Gully's neck, boat channel - - 182
Gum town - - - - 99

Haast river - - - - 335
Half-moon bay - - - 291
——-passage rock - - 275, 277
——-way islands, Otago (quarantine establishment) 265
——— rocks - - - 287
Hall's arm - - - - 323
Halswell point, rocks off and buoy - 141
Hamilton mount - - 20, 73
Hanfield inlet - - - 370
Hanson bay, anchorage - - 381
——— point, signal staff - - 384
Happy Valley peaks - - 147
Hapuka reef, beacon - - 195
——— rock, Foveaux strait - 286
Harbour islands - - - 321
Hardy mount - - - 108
—— port - - - - 185
Hares-ears rocks - - - 322
Harries bay - - - - 309
Harriet bay - - - - 160
Harrington point - - - 262
Harrison cove - - - 330
Haul-ashore cove - - - 323
———— island - - - 190
—— round point - - - 238
Hauraki gulf - - - 20
——— river - - - 208
Haussez or Mercury group - 27, 96
Havelock - - - 5, 9, 182
Hawea rock - - - - 122
Hawes rock and buoy - 175, 176
Hawini rocks - - - 125
Hawke bay and anchorages - 127 to 132
————, climate and wind - 131
————, province - - 5, 7
Hay island - - - - 63
Hayward point - - - 262
Hazelburgh group - - 275, 277
Heaphy point - - - 171
——— river (*Wakapoai*) - - 843
——— shoal - - - 383
Heel cove - - - - 325
Helensville - - - - 215
Hen and Chickens - - - 18
Henderson bay - - - 35
—————, Tory channel - 171
Henrietta bay - - - 275
Henry island - - 62, 63

Page
Heritanewha point - - - 335
Hermione rock - - - 49
Hicks bay and anchorage - 110, 111
Hieh channel - - 27, 28
—— island - - - - 28
High islet - - - - 69
—— rock - - - - 299
Hiko islet - - - - 151
Hikuraki sound - - - 182
Hikutu rocks - - - 119
Hobson mount - - - 89
Hoiere river - - - 182
Hoki island - - - - 84
Hokianga river - - 203 to 210
—————, anchorage above Middle ground - 205
—————, bar - - 204
—————, creeks - - 206
—————, directions for entering 203
—————, fogs - - 210
—————, narrows - - 205
—————, signals and pilot - 204
—————, soundings off coast 209
—————, stations - - 209
—————, tides - - 209
—————, tributaries - - 207
—————, winds - - 209
Hokitika river, anchorage off 5, 337
————, beacons, lights 337, 338
————, tides, population - 338
Hole in the Rock point - - 186
Home cape - - - - 62
—— point, Bland bay - - 62
————, Wangari - - 68
Hooker hills - - - 360
Hooper point - - - 34
Hope reef - - - 54, 58
—— shoal and buoy - - 140
Horn rock - - - 20, 89
Horse-shoe bay - - - 291
Horuhoru islet - - - 31
House-roof rock - - - 327
Howe point - - - - 44
—— rock - - - - 45
Howell point - - - 286
——— roadstead - - - 286
Howick - - - - 6
Huieh island - - - 84
Hukihuki pah - - - 99
Hume creek - - - 48
Hump, the - - - - 137
Hunakiwi bay - - - 189

Page
Hunters hills 256
Hurunui river 240
Hutt port 383, 384
—— river 143

Ikaurangi mountain 111
Indian island 315, 316
Ingles bay, directions 236, 237
Inlets, W. coast, Middle island 303 to 331
——, general description of 303 to 305
Invercargill 5, 11, 280, 285
Iris shoal 75
Iron head (*Timatim*) 252
Isthmus sound 308
Iwa-kawa mount 382

Jackson bay, Tory channel 171
——, west coast, Middle island 332, 333
——, anchorage 332
——, coast northward of 333
——, current off 333
——, unsafe in northerly winds 332
—— cape 174
—— head 332
Jacobs creek 322
—— river 286
Jag 184
Jed river 240
Jenny reef 383
Jerningham point, foul ground off and buoy 141
Jolliffe point 38
Judge and Clerk 387
Jules point 195

Kaduku (Hollyford) river 331
Kahau rocks and shoal 134
Kaiapoi township 243
Kaiaua point 183
Kaikora mountains 238
—— peninsula 236 to 239
——, tides 239
—— township 236
Kaimouhu head 118
Kaingaroa or Skirmish bay 377, 381
Kainoki rock 181, 183
Kaipara harbour 211 to 217
——, anchorage 213
——, bar 212
——, channel into 212
——, tides 216

Page
Kaipara-te-hau lake 168
Kaipipi bay 293
Kaipo bay 331
Kaipokonui stream 158
Kaitu-kala islands 75, 78
Kaituna river, bay of Plenty 106
——, Pelorus sound 182
Kakapo (McKerrow) lake 331
Kaouou bay 41
Kapiapia rock 227
Kapiti island 151
——, anchorages 151, 152
——, coast northward of 152
——, directions 152
——, tides 152
Kara-kara bay 36
—— cape 35, 36
Karamea river 343
Karamu-ramu islet 32
Karehoe mount 227
Karepo sound 182
Karewha island 102, 114
Karori or Seal rock 147
Kate point 234
Kati-kati river 102
Kaua-kaua river 44, 52
Kauauroa bay 181
Kaueranga creek 86
Kauri forests 2, 67, 81
—— point 30
Kava islet 42
Kawai point anchorage 213
—— sound 183
Kawa-kawa roadstead 111
Kawati point 75, 76
——, sunken shoal off 75
Kawau bay 75, 80
—— inner channel 80
—— island 24, 74 to 77
—— north channel, dangers and directions 75, 76
—— point 77
—— south channel, directions 78, 79
——, tides 78
Kawhia harbour, entrance channels 230, 231
——, tides 231
Kawitihu island 97
Keke island 54
Kelly rock 275
Kelp reef 258

Page

Kennedy bay (*Aratuka*) 95
———, rock off South point 95
Kent passage 45, 48
Keri-keri river 47
Ketu bay 181
Kiahou islet 80
Kidnappers cape, anchorage 132
———, dangers 132
Kikowhakariri bay 84
Kings, Three, islands 17, 201
Kiourangi point 343
Kirita bay 85
Knuckle hill, mount Burnett 197, 199, 344
——— point 38
Koamoroo cape 172, 174
Koatunui head 119
Kohaihai river 343
Kohau cove, Hicks bay 111
——— or Iron point 110
Kohi point 107
Kopai anchorage 182
——— village 180, 182
Kopu anchorage 87
Koputai bay 262, 265
Koputetea river 123
Koranga island 98
Korapuki island 97
Koreho channel 27, 28
——— island 28
——— shoal 28
Koronohina point 108
Kororarika (port Russell) anchorage 48
——— bay 48
———, bank off 52
——— harbour light 49
——— tides 60
——— town 53
Koruenga islets 97
Koti-kau point 35
Kotiki point 109

Lake cove 313
——— Kaipara-te-hau 168
——— Kakapo 331
——— Rotorua 105
——— Rotuaro 341
——— Rotuiti 342
——— Te Wanga 379
——— Waihora 244, 253
——— Wakatipa 331
Lambert cape 175, 179

Page

Lambton harbour, port Nicholson 141
———, buoys, lights and piers 142
———, tides 144
Landguard bluff 154
Landing bay 312
Laurie harbour 368
Lebrun peninsula 186
Lee islet 274
Lees peak 289
Levy port 249
Ligar port 183
Lights, Akaroa head 252
  Alapawa island, Tory channel 171
  Auckland harbour 25
  Bean rocks 24
  Bluff harbour 281
  Brothers islands 173
  Buller river 342
  Cape Campbell 167, 235
  ——— Egmont 160
  ——— Farewell (Bush-end point) 197
  ——— Foulwind 341
  ——— Maria Van Diemen 33, 201
  ——— Saunders 266
  ——— Wanbrow 257
  Centre island 286
  Dog island 283
  Godley head (port Lyttelton) 246
  Grahamstown, river Thames 86
  Grey river 339
  Hokitika or Brunner river 337
  Manawatu river 153
  Manukau harbour 219
  Moerangi bay 258
  Moko-hinou islands 19
  Nelson, Boulder bank 191
  New Plymouth 163
  Nugget point 267
  Oamaru 257
  Otago harbour 260
  Patea river 157
  Pauhenehe spit (Sandspit passage) 31
  Pencarrow head 138
  Picton, Queen Charlotte sound 177
  Port Lyttelton 246
  ——— Napier (*Ahuriri*) 129
  ——— Nicholson 138, 142, 143
  ——— Russell (*Kororarika*) 49
  Portland island 126
  Puysegur point 306

Page
Lights—*cont.*
Rewaka river - - - 196
Somes island - - 143
Starling point - - - 281
Timaru - - - 255
Tiri-tiri island - - - 21
Turanga-nui, Poverty bay - 122
Wairau river - - - 169
Wanganui river, Cook strait - 155
Limeburners' creek - - - 72
Limestone island - - - 70
Little Barrier island - - 20
——— bay - - - - 329
——— island - - - 313
——— Oma bay - - - 74
——— port Cooper - - - 247
Llawrenny peaks - - - 329
Long island, Dusky sound - - 316
———, Queen Charlotte Sound 175, 176
———, Stewart island - 298
Longlookout point - - - 250
Long point (*Irihuka*) - - 268
———, Kapiti island - - 151
——— (*Kohuamarua*) - 335
——— roadstead, Hawke bay - 127
——— sound - - - 309
Longsight mount - - - 328
Looker-on mountains - - 238
Looking-glass bay - - - 327
Lookout bluff (*Awa-mokihi*) - 258
Lookout-for reef - - - 299
Lords river - - - 295
Lort Point - - - 70
Lottin point - - - 110
Luhrs rock - - - - 146
Luke rock and buoy - 175, 177
Luna rock - - - 147
Lyall bay - - - 139, 146
——— hill - - - - 371
Lynch reef - - - 236
Lyttelton port - - 245 to 249
———, inner harbour and docks - 248, 249
———, light - - 246
———, pilot station - 246
———, telegraph cable - 249
———, tides - - 247
———, time ball, patent slip 249
———, town of - - 5, 10, 246
Lyvia river - - - 323

Page
Macdonald island - - - 324
Macgregor rock - - 19, 73
Mackenzie cove - - - 73
Macquarie island - - - 386
Mahakipawa arm - - - 182
Mahana river - - - 343
Mahanga, boat harbour - - 123
Mahau sound - - - 182
Mahew islet - - - 151
Mahia peninsula (*Tera-kako*) - 124
———, dangers - - 125
Makarau channel - - - 214
Makawiho point - - - 335
Maketu mound - - - 104
——— pah - - - 106
Makiwi cove - - - 58
Mamiaro sound - - - 182
Mana or Table island - - 150
———, anchorage - 150
Manaia peak - - - 69
Manawara bay and directions - 56
Manawarakau river and pah - 183
Manawaroroa point - - - 48
Manawatu river, pilot station - 152
———, lights - - 158
Mangahau or Nairn river - - 379
Manga-nui island - - - 81
Mangapai river - - - 72
Mangawai river - - - 74
Mangere island - - - 386
Mangrove river - - - 99
Manukau harbour - - 217 to 225
———, anchorages - 221
———, bar - - 220
———, directions for South channel - 221
———, entrance - 219
——— channels 220
———, inner waters - 222
———, light - - 219
———, local signals 218, 219
———, tides and winds - 222
Many coves bay - - - 177
——— peaks, mount - - 20
Maori bay - - - 71
——— rock and beacon - 75, 76
Maraenui river - - - 108
Maraitai point - - - 29
Marakopa river - - - 232
Marau bluff - - - 119
Mare bank and buoy - 67, 68

Page
Maria Van Diemen cape - 17, 33, 201
———————, tides off - 201
Marlborough province - - 5, 9
Marshals rock - - - 288
Martello rock - - - 77
Martin bay, Hokianga river - 205
————, W. coast, Middle island 4, 331
Mary Catherine bank - - 215
Mason bay - - - - 299
Massacre bay - - 196 to 199
—————, coal found in - 198
—————, directions for entering 199
—————, surf - - - 198
—————, tides - - 200
Matahau point - - - 118
Matai bay - - - - 37
Matakana river - - - 75
Matakawa point - - - 110
Matakitaki mount - - - 381
Matakohae creek - - - 211
Matapaua bay - - - 98
Matata river - - - 106
Mataura river - - - 269
Matauri bay - - - 43
Matungi-tawau point - 336, 340
Maungamuka river - - - 207
Maunga-nui mount, Tauranga harbour 103
——————, Chatham islands 380
Maungataniwa mountain - - 203
Maungatipa village - - - 207
Maurhangi harbour and river - 80
——————, directions and anchorage 81
——————, tides - - 81
Mawai point - - - 119
Mayne islands - - - 77
Mayor island (*Tuhua*) - 113, 114
McClellan point - - - 240
Melville cove - - - 179
Memory creek - - - 198
Menia bay - - - - 85
Mercer town - - - 226
Mercia shoal - - - 132
Mercury bay - - 97 to 100
————, tides - - - 99
———, Great, island (*Ahou-ahou*) 96
——— islands (D'Haussez group) 96, 97
———, Red, island (*Wakahu*) - 96
Micrometer rock - - - 297
Midbay reef - - 288

Page
Midbay rocks, Gore bay - - 241
Middle bank, Current basin - 187
—————, frith of Thames - 85
——— ground, Hokianga river - 205
———island, Mercury bay - - 98
————— of New Zealand - 1, 8
——— point - - - 46
Midway point - - - 110
Miho-tahi hill - - - 165
Milford sound - - 329 to 331
—————, anchorage - - 330
—————, coast northward of - 331
—————, Mitre peak - - 329
—————, remarkable appearance of 329
—————, tides - - - 331
Mimiwanca bay - - - 64
Miners head - - - 90
Minna bay - - - - 169
Mistaken islet - - - 259
Mitre peak - - - - 329
Moemoto head, shoal off - 127, 132
Moerangi (Moeraki) bay - - 258
———————, light - 258
Moggy isle - - - - 298
Mohaka river - - - 128
Moi-tapu bay - - - 182
Moitera point and rock - - 183
Mokau river - - - 232
Mokihinui river - - - 342
Moko-hinou islands - 19, 89
——————, light - - 19
Molyneux bay, anchorage - - 267
Momona bay - - - 76
Monganui bluff - - 203, 210
———— harbour - - 38
——————, anchorage - 39
——————, tides - - 39
————, rocks - - - 202
Monument harbour, Campbell island 373
Monumental islet - - - 366
Morahahi head - - - 119
Moro-tiri or Chicken islands - 18
Motara bluff and islet - - 120
Motiti island and dangers - 106, 114
Motu-ara island - - - 175
—————, rocky patch - 176
———arahi island - - - 50
———arohia island - - - 49
——eka river - - - 194

Page
Motu-heka island - - - 120
——hora island - - 107, 115
——karaka river - - - 207
——korure island - - - 98
——kura or Bare island - - 133
——mahanga, New Plymouth - 165
——mea island - - - 49
—— nau, Plate island - 113, 115
———— or Table island - - 242
——ngara island - - - 179
——nui peninsula - - - 108
——ora island - - 75, 79
——otau island - - - 103
——otuna islet - - - 36
——pea islet - - - 202
——pipi river - - - 198
——ripa islet - - - 119
——roa island - - - 44
——— islets - - - 36
—————, New Plymouth 161, 165
——rua island - - - 54
——tapu island - - 22, 27
——tara rocks - - - 37
——ti creek - - - 207
Mount Albert - - - 146
——— Anglem - - 277, 289
——— Arthur - - - 189
——— Burnett or Knuckle hill 197, 199, 344
——— Camel - - 35, 36
——— Caverhill - - - 239
——— Cook - - 8, 329, 334
——— Dieffenbach (*Wakapai*) - 382
——— Duppa - - - 189
——— Edgcumbe - - - 106
——— Egmont - - - 161
——— Elliott - - - 161
——— Eyes - - - 237
——— Francis - - - 137
——— Furneaux - - - 179
——— Groznoz - - - 322
——— Hamilton - - 20, 73
——— Hardy - - - 108
——— Herbert - - - 246
——— Hobson - - - 89
——— Iwakawa - - - 382
——— Karehoe - - - 227
——— Longsight - - - 328
——— Many peaks - - 20
——— Maunga-nui - - 103
—————, Chatham islands 380

Page
Mount Patterson (*Matakitaki*) - 381
——— Pleasant - - - 246
——— Pocock - - - 44
——— Rintoul - - - 189
——— Robertson - - - 169
——— Ruapehu - - - 154
——— Stokes - - - 179
——— Tako - - - 167
——— Tauperi (Devil's thumb) - 154
——— Tongariro - - - 154
——— Treble, Cook strait - 169, 175
—————, Preservation inlet 306, 310
——— Victoria - - - 23
——— Waka-huranga - - 212
——— Wharton - - - 238
——— Woore - - 184, 186
Moutapu point - - - 385
Moutere river - - - 194
Mowhiauru islet - - - 119
Munning point - - - 377
Murray river and roadstead - - 290
Musgrave harbour, anchorage - 369
——— inlet - - - 369
Mussel beach - - - 288

Nagle cove and tides - - 91
Nancy sound - - - 325
—————, anchorage - - 325
Napier port (*Ahuriri*) - - 128
——— town - - 5, 130
Napper reef - - - - 383
Narrow bend - - - 309
——— passage - - - 296
Native island - - - 292
Natives - - - - 12
Navire rock - - - 19, 89
Nea islets - - - - 322
—————, reefs off - - - 322
Neck cove - - - - 324
Needles point - - - 90
Negara islet - - - 178
Nelson, climate, population, &c. - 5, 8
——— haven - - 190 to 193
—————, anchorage outside bar 191
—————, directions 191 to 193
—————, light - - 191
—————, pilot necessary - 190
—————, tides - - 193

Page
Nelson rock, Kawau island - - 77
Nelson's monument - - - 185
Newhaven river, town - - 268
New Plymouth (*Taranaki*) 5, 7, 161
————, anchorage - - 162
————, directions - - 163
————, harbour light - 163
————, roadstead, &c. 161 to 166
————, signals - - 166
————, tides - - 165
————, Wesleyan mission - 162
————, winds and weather - 165
New river (*Orete*) - - 284, 285
————, bar - - - 284
————, coast westward of - 286
————, directions for entering - 285
————, tides - - - 285
Newton rock - - - 290
New Zealand, general harbour signals 15
————, mean time - - 16
Nga-motu islands (Sugarloaf) 161, 165
——raruro river - - - 132
Ngatoka-rarangui point - - 43
Nicholson port - - - 138
————, anchorage outside 138, 145
————, coast westward of - 146
————, dangers to avoid approaching from westward - - 147
————, entering at night - 144
————, main channel - 140
————, meeting a gale at entrance - - 144
————, pilot station - - 139
————, tides - - - 144
Nile head - - - - 185
Nine-fathom passage - - 317
Nine-pin rock (*Tiki-tiki*) - - 44
Ninety-miles beach - - - 253
Noble island - - - 296
Nongodo river - - - 66
Nops island - - - 63
Norman inlet - - - 370
North arm anchorage - - 369
——— cape (*Otou*) - - 18, 34
————, islet - - - 34
——— cove - - - - 77
——— head, Auckland harbour - 23
——— island of New Zealand - 1, 2
——— port - - - - 313
————, blind entrance - - 313

Page
North port, ship entrance - - 313
——— rock, Tauranga - - 103
North-east harbour, Campbell island 373
———— island, Snares - - 301
————————, boat harbour - 301
———— King island - - 17
———— reef, Chatham islands - 385
North-west cape, Auckland islands 365
———— reef, Chatham islands - 382
Nugget point - - - 266
————, light - - 267

Oahau river - - - - 152
Oaia islet - - - - 217
Oaie island - - - - 182
Oamaru anchorage, breakwater, &c. - - - 257, 258
Observation bluff - - 274, 275
Observatory islet (*Kairaro*) - 49
Occasional cove - - - 319
Ocean bay - - - - 170
——— island - - - 368
Ohako peak - - - 217
Oharui bight - - - 149
Ohena island - - - 97
Ohihupa creek - - - 206
Ohingaroa bay - - - 182
Ohiwa river - - - 107
Ohora bay and anchorage - - 36
——— river - - - - 36
Ohunga-hunga bay - - - 38
Okahi or Red island - - 54
Okarito lagoon - - 4, 5, 335
————, signals, tides - 336
Oke rock and beacon - - 181
Oken bay - - - - 251
Okiato point - - - 50
Okorapu reef - - - 114
Okupu bay - - - - 93
Okura river - - - - 82
Old Man rock - - 97, 98
Old neck beach - - - 292
————, anchorage - - 293
Oma bay - - - - 74
——— cove - - - - 74
Omaio village - - - 108
Omanai river - - - 208
Omokoiti village - - - 213
Onehunga town - - 5, 224

Page
Onehunga, main channel - - 223
Only isles - - - - 309
Onoui bay - - - - 253
Onslow or Howe rock - - 45
Opani point - - - - 86
Opape point - - - 108
Opawaha or Avon river - 10, 243
Open bay (*Waipiro*) - - 118
——— islets (*Taumaki*), anchorage 333
—— cove - - - - 324
Opito bay anchorage - - 98
Opokohino point - - - 108
Opopo bay, Waiheki island - 30, 88
Opotiki river - - - 107
——— mission station - - 107
Opouri bay - - - 182
Opunake bay - - 158 to 160
———, beacons, directions - 159
———, signals - - 160
———, tides - - - 159
Oputu or Shoal bay - - - 133
Orarapa islet - - - 22
Oraukaua cove - - - 56
Oreri point and rocks - - 32
Orete point - - - - 109
Orewa river - - - 208
Orewera river - - - 107
Orieri island - - 181, 182
Orini river - - - - 107
Orong-orong river - - - 137
Oruawharu river - - - 215
Orupukapuka island - - 54
———, anchorage - 58
Orurua bay and village - - 38
Orwell shoal - - - 220
Otago harbour - - 260 to 265
———, anchorage outside - 261
———, approach to - - 260
———, bars - - 262
———, buoys and beacons - 263
———, directions for crossing bar - - 263
———, docks, patent slip (port Chalmers) 265
———, entrance - - 261
———, lights - - 260
———, north channel - 264
———, pilot station - 261
———, signals - - 260
———, time ball (port Chalmers) - - 265

Page
Otago harbour, tides - - 264
——— province, climate, population, &c. - - - 5, 11
——— retreat, Preservation inlet 306, 309
Otaki river and village - - 152
Otamarako pah - - - 106
Otamotea river - - 211, 215
Otatou islands - - 22, 27
Otawaki island - - - 54
Otehi point - - - - 35
Otumoiti village - - - 105
Otumutua point - - - 158
Oyster bay, Tory channel - - 171
——— cove, port Underwood - 170
———, Stewart island - 294
——— creek - - - 99
——— river - - - 97

Paget rock - - - - 91
Pah hill - - - - 122
—— point, bay of Islands - - 47
———, Mangrove river - - 99
Pahia point - - - 286, 287
Pahiki island and light - 6, 31
Paihia islet - - - 50
—— village and mission station - 50
Pakatoa island - - - 80
Palliser bay - - - - 137
——— cape - - 135, 167
———, rocks and tide ripplings off - - - 135
Palmer head and West ledge - 189
Panaruku bay - - - 110
Pandora bank - - 84, 201
——— rock - - - 99
Pania rock and buoy - 129, 132
Pani-pani beach - - - 105
Panmure - - - - 80
Papakura channel, Manukau harbour 224
Papanui stream - - - 269
Paparoa mountains - - 340
Parangahau river - - - 133
Parara river - - - 343
Paratutai - - - - 219
Parekura bay - - -
Parenga-renga harbour, anchorage 34, 35
———, directions - 35
———, tides - 35
Parera rock - - - - 217
Pari-okariwa point and reef - 232
Paroa bay - - - - 56

Page
Parrot island - - - 317
Parson rock - - - 247
Passage islands - - - 311
——— islet, Wangari - - 68
——— and reef, Stewart island 292
——— point - - - 319
——— reef, Kawau - - 78
———, Chatham islands - 386
——— rock, Tehmaki strait - 30
——— rocks, Kapiti island - 151
Patea river, light, signals, tides - 157
Paterson inlet - - 292, 293
———, directions - - 292
Patiti point and reef - - 255
Patricks, St., cove - - - 119
Patten passage - - - 176
Patterson mount (*Matakitaki*) 376, 381
——— point - - - 382
Patupo or Big river - - 288
Pauhenehe spit and light - - 31
Paxton point - - - 35
Peach island - - - 41
Pearl island - - - 296
Pegasus bay - - - 242
——— port - - 296, 297
———, Acheron anchorage - 297
———, channels into - - 296
———, islands in entrance of - 296
———, north arm - - 296
———, south arm - - 297
———, tides - - - 300
Pehetaire point - - - 108
Pelham bay - - - 191
Pelorus rock - - 180, 181
——— sound - - 179 to 183
———, bays and anchorages 181
———, character of country 180
———, tides and winds - 183
Pembles islet - - - 76
Pembroke peak - - - 329
Pencarrow head, light - - 138
Pender rock - - - 291
Penguin bay, Campbell island - 373
———, cape Foulwind - 340
Pepin island - - - 190
Peraki cove - - - 253
Perpendicular point - 340
Perseverance harbour - - 371
Petre bay, Chatham islands - 380, 383
——— town - - - - 155
Petrel islands - - - 314

Page
Phillips island - - 66
Piako river and landmarks - - 88
Piaukahe bay - - 182
Pickersgill harbour - - 315
——— island - - - 176
Picton light, township - 9, 177
Piège rocks - - - - 186
Piercy islet - - - 18, 59
Pig island, Foveaux strait - - 287
———, Queen Charlotte sound - 176
—— islands, Great Barrier island - 92
Pigeon bay (*Wakaroa*) - - 250
——— island - - - 317
——— point - - - 250
Pilots bay - - - - 103
Pinnacle rock - - 307, 311
Pinohia or Hikapu reach - - 182
Pipi-roa bay - - - 50
Pipitea point - - - 141
Pirogue rocks - - - 92
Pironghia mountains - - 230
Pitt island and anchorages - - 385
———, supplies - - - 386
—— strait - - - - 385
Plate island (*Motu-nau*) - 113, 115
Plenty, bay of - - 100 to 109
———, islands and rocks in 113 to 117
Plymouth, New (*Taranaki*) - 161
Pocock mount - - - 44
Poison bay - - - - 329
Pokokini bay - - - 182
Pomarè bay - - - - 50
Pompey's pillar - - - 251
Ponui head - - - 30
——— island - - - 30
Poor Knights island (*Tawhiti-rahi*) 18
——— rocks - - - 18
Popoure reach - - - 182
Population, European - 6 to 12
———, native - - 12, 13
Poraenui point - - - 45
Porirua harbour - - - 149
———, tides - - 150
———, coast northward of - - 150
Poroporo island - - 55, 57
Porpoise rock - - - 318
Port Abercrombie - - - 90
—— Adventure - - - 294
—— Easy - - - - 298
—— Fitzroy - - 91

Page
Port Gore - 178
—— Hardy - 185
—— Hutt - 383
—— Levy - 249
—— Ligar - 183
—— Lyttelton or Victoria 245 to 249
—— Napier (*Ahuriri*) 128 to 131
—— Nicholson - 138
——, North - 313
—— Pegasus 296, 297
—— Ross or Sarah's bosom harbour 366 to 368
—— Russell (*Kororarika*) - 48
——, South - 312
—— Tepuna 46, 47
—— Tofino - 93
—— Underwood 169, 170
—— Waitangi - 384
—— Wangape - 203
—— William 284, 290
Portland island (*Te-houra*) - 125
————, light - 126
Poukourou river - 47
Pouto point - 213
Poverty bay (*Turanga*) 121 to 123
————, anchorage 122, 123
————, church mission - 123
————, dangers - 122
————, light - 122
————, rivers 122, 123
————, tides - 123
Precipice cove - 324
Preservation inlet 306 to 310
————, approach to - 306
————, directions for entering - 307
————, fish abundant - 310
————, south entrance 309, 310
————, sunken reef - 307
————, tides - 310
Price's beach - 307
—— boat harbour - 288
Providence cape, and reefs off 310, 311
Province, Auckland - 6
————, Canterbury - 10
————, Hawke bay - 7
————, Marlborough - 9
————, Nelson - 8
————, Otago - 11
————, Taranaki - 7
————, Wellington - 8

Page
Province, Westland - 12
Provinces, Northern - 5
————, Southern - 5
Puheki hill - 36
Puhoi river - 81
Puke-tapu reef - 161
Pukitu hill - 212
Pukoro-koro river - 88
Punehu creek - 206
Pungaheke village - 208
Pupuarue mission station - 107
Pupuwae creek - 206
Purakau channel, Manukau - 224
Putakolo head - 251
Puysegur point 288, 306
————, light - 306
Puzzle peaks - 179
Pyramid rock - 386

Quail island 246, 247
Queen Charlotte sound 174 to 178
————, directions - 174
————, gusts of wind 178
————, light - 177
————, tides - 178
————, western shore of 176
Quoin point - 266

Ragged point - 186
Raglan, town of - 227
Rakeahua mountains - 289
Rakino island - 22
Rangaounou bay 35, 36
———— river (*Awanui*) - 37
————, directions, tides - 37
Rangatira (S.E. island) - 386
———— bank, Napier - 130
Rangiauria or Pitt island - 385
Rangihoua bay - 45
Rangiora or Aopuri range - 196
Rangipuka island - 85
Rangiriri - 6
Rangitiki river - 153
Rangitoto channel - 27
————, dangers - 22
———— island, Hauraki gulf - 21
———— islands, D'Urville island - 185
———— roadstead, do. - 184
————, tides - 185
Rangi-tutahi or Sisters islands - 382

Page
Raukura point - - - - 32
Raupo bay - - - - - 37
Rawiti, the - - - 53 to 59
————, anchorages in - 55 to 59
—— dangers - - 54 to 59
——, eastern or Albert channel 54, 58
—— island passages, directions 54, 55
——, western entrance - - 53
Red bluff - - - - - 380
— head - - - - - 54
— Mercury island - - 96
Reef islet - - - - 147
—— point, Ahaipara - - 202
————, Chalky inlet - - 312
————, French pass - - 187
Reinga cape - - - - 34
Reporua village - - - 118
Resolution bay - - - 177
———— island - - 314, 319
——————, outer coast - 319
Return channel - - 311, 313
Revolver bay - - - 309
Rewaka river and light - - 196
Richard's peninsula - 54, 59
———— rock - - - 96
Richmond cove (*Kopaua*) - - 181
Rimutaka mountains - - 137
Rintoul mount - - - 189
Ripa island (quarantine station) - 249
River point, Wangari - - 71
—— Thames (*Waiho*) - - 86
Riverton township - - 14, 286
Robertson mount - - 169, 175
———— point, Cook strait - 169
——————, West coast, Middle island - 340
Robin Hood bay - - - 169
Rock Cod point - - - 187
Rocks point - - - 343
Rodney point - - - 20
Rolla island - - - - 323
Rosario channel, Kawau - - 78
——————, directions - - 78
Rose island - - - - 366
Ross port, or Sarah's bosom harbour 366 to 368
Rotaro island - - - 30
Rotorua lakes - - - 105
Rotuaro lake - - - 341
Rotuiti lake - - - - 342
Rough rock - - - 22

Page
Round island, Star Keys group - 386
——— islet, bay of Islands - - 58
————, Preservation inlet - 308
——— rock, Chatham islands - 386
Ruakaka river - - - 73
Ruamahunga river - - - 137
Ruapehu mountain - - - 154
Ruapuke island - - 273 to 276
——————, anchorage and directions - - 274
——————, dangers off - 273, 274
——————, landing at - - 275
——————, look-out from aloft necessary - 276
——————, mission station - 275
——————, outlying rocks - 275
——————, passage north of - 276
—————————— south of - 277
——————, tides 276, 278, 300
Ruby shoal - - - 238
Rugged islands (Raggedy point) - 300
——— point - - - 63
Runaway cape - - - 109
Ru-rima rocks - - 107, 116
Russell port - - - 48
—————, bank off - - 52
—————, directions - - 49

Saddle hill - - - - 266
——— point - - - 289
——— rocks - - - 185
Sadler point - - - 80
Sail rock (*Toutorou*) - - 19
————, Chatham islands - - 386
————, East coast, Middle island - 242
—— rocks, Banks peninsula - 251
Sandhill point - - - 287
Sandspit passage, light, (Tehmaki strait) 31
——————, directions - 31, 32
Sandy bay, East coast, North island 65
———— anchorage, Enderby island 366
——— point, Preservation inlet - 309
——— or Marsden point, Wangari 68, 69
Saunders cape and light - 260, 266
Sauvage point - - - 186
Schooner rocks - - - 114
Seal creek - - - - 297
—— rock (*Karori*), Cook strait - 147
————, Dusky sound - - 318
—— rocks, New Plymouth - - 165
————, Ruapuke island - 273

Page
Seal rocks, West coast, Middle island 331
Sealers bay 299
Secretary island 322
——————, west shore 324
Selwyn island 90
Sentinel rock 180
Sentry reef 385
Separation inlet, Queen Charlotte sound 177
———— point, bay of Islands 47
——————, Blind bay 194
——————, Great Barrier island 90
——————, port Underwood 169
Settlements 6 to 12
Seven hummocks 154
Shag isles 319
—— reef 247
Shearer rock and buoy 21
Shelter cove 315
——— islands 322
——————, small craft anchorage 322
——— point 294
Ship cove and anchorage 175
Shipbuilders cove 297
Shoal cove 325
—— point 371
Shoe island, bay of Plenty 101, 113
—————, Auckland islands 368
Shortland 6, 86
Simmonds islands 35
Simpson rock 19, 89
Sinclair head 147
——— point 70
Single rock 31
——— tree point 70
Sisters islets (*Rangi-tutahi*) 382
Skirmish or Kaingaroa bay 377, 381
Slains Castle rock 46
Slip islet 75
Slipper island 101, 113
Slope point 269
Small-craft harbour islets 314
Smelting cove 76
Smith harbour and anchorage 370
——— sound 323
Snake bank and buoy 71
Snares islands 300 to 302
Snout, the 178
Snug cove, Doubtful inlet 323
—————, Pelorus sound 181
Solander island 272

Page
Somes island and light 143
——— point, Chatham islands 382
——— rock 143
Soucis cape 189
Soundings, Abut to Bold head 339
—————, Albatross point to New Plymouth 232
—————, Banks peninsula to Otago 259
—————, bay of Plenty 108
—————, cape Campbell to Banks peninsula 244
—————————— Foulwind to Rocks point 343
—————, Cascade point to Jackson bay 332
—————, Cook strait 167
—————, East cape to Hawke bay 126
—————, Foveaux strait 271 to 277
—————, Hawke bay to Castle point 134
—————, Hicks bay to East cape 111
—————, Hokianga river 205
————— off Banks peninsula 244, 251, 253
—————————— cape Farewell spit 197
—————————— Maria Van Diemen 201
—————————— Turnagain 134
—————————— Hokianga river 209
—————————— North coast, North island 33
—————, Open bay to Tolago bay 119
—————, Otago to Foveaux strait 267, 270
—————, Pegasus bay 242
—————, Pelorus sound 181
—————, Waikato river to Whaingaroa 227
—————, Wanganui river to New Plymouth 161
—————, West coast, Middle island 304
South cape, Cooks 297
—— or Stewart island 1, 4, 288 to 300
—— islets 275
—— point, Dusky sound 314
—— port 312
South-west bay 293
————— cape 297
————— King island 17
Spirits bay 34
Spit islet 307

Page
Sporing island - - - 120
Squally cove - - - 190
St. Ann's point - - - 330
—— Patrick's cove - - - 119
Starling point, light and semaphore 281
Steamer pass - - - 297
Steep head and islet of - - 284
Steeple rock - - - 140
Steeples rocks - - - 341
Steep-to islet (Crayfish) - - 308
Stella rock - - - - 174
Step island - - - - 43
Stephens cape - - 185
———— island - - - 184
Stephenson island (*Mahinepua*) - 40
Stevens cove - - - 320
Stewart breaker (*Kiourangi shoal*) 343
———— or South island 1, 4, 288 to 300
————————, anchorage off east coast 272
————————, general remarks 288 289
————————, south-west coast - 298
————————, tides 278, 300
Stirling head - - - 294
Stokes mount - - - 179
Stony point - - - - 103
Stripe head - - - - 313
Sugar-loaf (Frenchman), Wangari - 68
———— hill (*Paretutu*), New Plymouth - 161, 165
———— islands (*Nga-motu*) 161, 165
————————, anchorage - 165
———— islet, Whangamata river - 101
———— rock, poor Knights 18, 60
———— rocks, Auckland islands - 365
Sunday rock - - - - 30
Sunk rock, Chalky inlet - - 312
————, Mercury bay - 97, 98
————, Queen Charlotte sound 175, 177
Sunken reef, Preservation inlet - 307
Sunk-kelp shoal - - - 75
Sydney cove - - - 293

Table cape - - - - 125
—— island (*Motunau*) - - 242
—— mountain - - - 328
—— rock - - - - 306
Taieri river - - - - 266
Taipa river - - - - 39

Page
Tairoa head, light - - - 260
Tairua river - - - 101
Takaka point - - - 181
Takapona head - - - 22
Takatau point - - 20, 74
Tako bay - - - - 43
—— mount - - - - 167
Takoupo or Channel islet - 27, 31, 95
Tamuakaiwawi bay - - - 182
Taourakira head - - - 137
Tapeka point - - - 48
Tapora channel - - - 216
Tapu creek - - - - 86
—— point - - - 50, 51
Tarakihi islet - - - 31
Taranaki province - - - 5, 7
Taranga (Hen) island - - 19
屏Tararu point - - - 86
Tarawera rock - - - 323
Tasman corner, anchorage - - 198
Tata anchorage - - - 199
Tatara reef - - - - 120
Taumaki or Open bay islets - 4, 333
Tauperi mount (Devil's thumb) - 154
Tauranga harbour - 5, 102 to 105
————————, tides - - 105
Tautuku bay and river - - 268
————————, anchorage off - 268
Tawhiti hill - - - - 118
————nui islet - - 182
———— reach - - 181, 182
Te-ao islet - - - - 58
Tehmaki river - - - 29
———— strait - - 29
————————, shell bank in - 29
Te-ho head - - - - 102
Te-kaha point - - - 108
Tekoa mountains - - - 240
Tekomi harbour - - - 85
Te Kotia-tia point - - - 37
Te Manga-pe river - - - 379
Te-nama pah - - - 158
Tepahi islands - - - 45
Tepaki point - - 96, 98
Te-papa mission station - - 105
Te-puki-te-huri spit - - 37
Tepuna bay - - - - 45
———— port - - 46, 47
————————, anchorage - - 47
Tera-kako or Mahia peninsula - 124
Terawiti cape - - - 148

Page
Terawiti cape, coast northward of - 149
————, tides off - - 148
Teremakau river - - 4, 338
————, tides - - 338
Terror cove - - - - 367
————, tides - - - 368
———— shoal - - - - 371
Terua point - - - - 232
————tuitui mountain - - 225
Te-tui or Mahurangi island - 98
Tewaewae bay - - - 287
————, anchorage in - 288
————, mid-bay reef in - 288
———— rock, Bluff harbour - 282
Te Wakuru islet - - - 381
Te Wanga lake - - - 379
Tewero point - - - 181
Thames frith - - - 83
————, directions - 87, 88
———— river (Waiho) - - 86
————, bar of - - 86
————, tides - - - 87
Thompson sound - - - 324
————, anchorages - 324
Three-gables headlands - 60, 65
Three Kings islands - 17, 201
———— rocks (Eastern reef) - - 386
———— rocky islets (Valkner) 113, 117
———— steeples rocks - - 341
Thumb point - - 31, 83
Tides, Ahaipara bay - - 202
——, Akaroa harbour - - 253
——, Aotea harbour - - 230
——, Astrolabe road - - 196
——, Auckland harbour - - 26
———— islands - - 368
——, bay of Islands - 49, 60
———— Plenty (Te-kaha point) 109
——, Bluff harbour - - - 283
——, Bon Accord harbour - - 78
——, Buller river - - - 342
——, Campbell island - - 371
——, cape Campbell - - 167
———— Farewell - 200, 345
———— Maria Van Diemen - 201
———— Runaway - - 109
———— Terawiti - - - 148
——, Cavalli islands - - 43
——, Chalky or Dark cloud inlet - 314
——, Chatham islands - - 383
——, Clutha river - - - 267

Page
Tides, Cook strait - 144, 147, 148, 149
——, Croisilles harbour - - 190
——, D'Urville island (Rangitoto road) - - 185
——, Dusky sound or bay (Duck cove) - - - 318
——, East cape - - - 112
———— to Hawke bay - 126
——, East coast of North island - 32
——, Foveaux strait - 276, 278, 300
——, French pass - - - 188
——, frith of Thames - - 87
——, Great Barrier island - 32, 91, 94
——, Grey river - - - 293
——, Hauraki gulf - - - 32
——, Hawke bay (Long point) - 131
——, Hicks bay - - - 111
——, Hokianga river - - 209
——, Hokitika river - - 338
——, Kaikora peninsula - - 239
——, Kaipara harbour - - 216
——, Kapiti island - - - 152
——, Kawau bay - - - 78
——, Kawhia harbour - - 231
——, Lambton harbour, port Nicholson - - - - 144
——, Long point, Hawke bay - - 131
——, Manawatu bar - - 153
——, Mangrove river - - 99
——, Manukau harbour - - 222
——, Mason bay - - - 300
——, Massacre bay (Motu-pipi) - 200
——, Maurhangi river - - 81
——, Mercury bay - - 99, 100
——, Milford sound (Freshwater basin) - - - 331
——, Monganui harbour - - 39
——, Motu-mea island - - 49
——, Nelson haven - - - 193
——, New Plymouth - - 165
———— river - - - 285
——, North coast of North island - 201
——, Okarito lagoon - - 336
——, Opani point, river Thames - 87
——, Opotiki river - - - 108
——, Opunake bay - - - 159
——, Otago harbour - - 264
——, Pandora bank - - 201
——, Parenga-renga harbour - 35
——, Patea river - - - 157
——, Paterson inlet - - 300

Page

Tides, Pelorus sound - - 183
——, Perseverance harbour - 371
——, Porirua harbour - - 150
——, port Abercrombie - - 91
———— Adventure - - 300
———— Hardy - - - 186
———— Hutt or Whangaroa 383, 384
———— Lyttelton or Victoria - 247
———— Napier - - - 130
———— Nicholson - - 144
———— Pegasus - - - 300
———— Russell (*Kororarika*) - 60
———— William - - - 300
——, Poverty bay (Wero-wero river) 123
——, Preservation inlet - - 310
——, Queen Charlotte sound - 178
——, Rangaounou river - - 37
——, Rangitoto roadstead, D'Urville island - - - 185
——, Ruapuke island 276, 278, 300
——, Sinclair head, port Nicholson 148
——, Stewart or South island 278, 300
——, Tauranga harbour - - 105
——, Teremakau river - - 338
——, Terror cove - - - 368
——, Thames frith - - - 87
——, Thompson sound (Deas cove) - 325
——, Three Kings islands - 17, 201
——, Tory channel - 172, 178
——, Tutukaka harbour - - 66
——, Waiheki strait - - 32
——, Waikato river - - 226
——, Wairau river - - - 169
——, Wairoa river, Hauraki gulf - 30
——————, Hawke bay - 128
——————, Kaipara - 216
——, Waitera river - - - 234
——, Wanganui inlet - - 344
———— river - - 156
——, Wangaproa channel - - 82
——, Wangari harbour - - 70
——, Wangaroa harbour - - 42
——, Wangaruru harbour - - 64
——, Wero-wero river, Poverty bay 123
——, West coast of North island - 201
——, Whaingaroa harbour - - 228
——, Whangaroa or port Hutt 383, 384
Timaru roadstead - - 254 to 256
————, anchorage - 255
————, breakwater - 255
————, directions - - 254

Page

Timaru roadstead, lights and signals 255, 256
————, town of - - - 5
Ti-miko cliffs - - - 340
Tiri-tiri island and light - 20, 21
Titihai or Tititira head - 334
Titirangi bay - - - 179
Toby rock - - - - 273
Tofino bay - - 82
—— port - - - - 93
Tokamapuhia reef - - - 119
Tokama-puna rock - - - 232
Tokamonga rock - - - 118
Tokata village - - - 108
Tokeroa shoal - - - 115
Toke-toke point - - - 45
Tokomarua bay - - - 119
Tokoroa islet - - - 36
Tolago bay (*U-awa*) - - 119
Toloa head - - - 245, 250
Tom Bowline bay - - - 34
Toms rock and bank - - 147
Tonga island - - - 194
—— roadstead - - - 194
Tongariro mountain - 154, 225
Tongue point - - - 147
Toreamouna or Kipuru sound - 182
Toré-toré peninsula - - 50
Torrent bay - - - 194
Tory channel, Cook strait - - 170
————, beacon lights - - 171
————, directions - - 171
————, tides - - 172, 178
Totoes bay - - - - 269
Toutorou or Sail rock - - 19
Tower rock - - - - 98
—— rocks - - - 185
Town point - - - - 106
Trafalgar head - - - 185
Traps rocks, north reef - - 298
————, south reef - - 298
Treble mount, Cook strait - 169, 175
————, Preservation inlet 306, 310
—— peak, Mercury bay - - 100
Trevaccon head - - - 309
Trio islands - - - 184
Tua-hina point - - - 121
——motu peninsula - - 121
——wike islet - - - 268
Tucker cove - - - 371
—— point - - - 368

Page
Tuhuia islet - - - 83
Tuki-tuki river - - - 132
Tunapapoa pah - - - 108
Tungara cove - - - 133
Tupis island - - - 276
Turakini river - - - 153
Turanga-nui river - - - 122
————————, light - - 122
Tureruа creek - - - 228
Turn peak - - - - 325
Turnagain cape (*Te-poroporo*) - 133
———————, soundings off - 134
Turner island - - - 170
Turn-round point - - - 328
Tutukaka harbour - - 60, 65
Twins islet, Mercury bay - - 98
——— rock, bay of Islands - - 59
——— rocks, Queen Charlotte sound 176
—————, Stewart island - - 292
Two Thumb bay - - - 327

U-awa river - - - - 120
Underwood port - - 169, 170
————————, anchorage - 169
Useless bay - - - 309
———— islands - - - 318

Valkner islets - - 113, 117
Variation of compass 17, 33, 89, 136, 167, 201, 235, 271, 303, 360, 370, 373, 374, 376
Victoria mount - - - 23
———— or Lyttelton port - 245 to 249
Victory islet - - - 185
Vulcan point - - - 258

Waddel point - - - 140
Wahapu bay - - - 50
Wai-apu river - - - 117
Waiau river - - - 289
Waiau-toa river - - - 236
Waiau-ua river - - - 239
Waiharakaka river - - - 235
Waiheki island, channel - - 29
Waihere bay - - - 386
Waihi river - - - 106
Waihinau bay - - 181, 183
Waiho creek - - - 203
Waihora lake - - 244, 256
Waikanai river and village - - 151
Waikari islet - - - 51

Page
Waikara river - - 44, 51
————————, anchorage - - 51
Waikate bay - - - 88
Waikato river and directions - 225
————————, tides and townships - 226
Waikaua point - - - 108
Waikawa river - - - 268
———— stream - - - 118
Waikawau bay and river - - 95
Waikere point - - - 381
————, native settlement - - 379
Waikokopu anchorage - - 127
Waikouaiti bay - - - 259
Waikowhau creek - - - 86
Waima river - - - 208
Waimakariri river - - - 242
Waimangaroa point - - 51
Waimata island - - - 84
Waimate bight and pah - - 158
Waimea river - - - 193
———— plains - - - 8
Waimongo pah - - - 88
Wai-otahi stream - - - 107
Waipa river - - - 225
Waipapa harbour, Hawke bay - 128
————— hill, Chatham islands - 382
———— point, East coast, Middle island - - - 236
Waipapapa point, South coast, Middle island 269
————————————, coast dangerous 269
Waipari bay - - - 119
Waipero bay - - - 58
Waipipi point - - - 157
Waipu river - - - 73
Wairarapa valley - - - 137
Wairau plains - - 9, 168
——— river - - 9, 168
————————, light, telegraph, tides - 169
Wairoa river, Hauraki gulf - - 30
——————, Hawke bay - - 128
————————, Kaipara - 211, 216
Wairohea river - - - 205
Wairopa channel, Manukau - 221
Waitaha-nui river - - - 106
Waitakari river - - - 340
Waitangi bay, Chatham islands - 380
———— port, and supplies - 384
———— river, bay of Islands - 49
———— or Waitaki river, East coast, Middle island - - 256

Page
Waitata bay - - - 183
Waitemata river - - 2, 5, 26
Waitera river, directions, tides 233, 234
Waitohi bay - - - 177
Waitotara point - - - 157
——— river - - - 157
Waitui bay - - - - 179
Waiuku channel, Manukau - - 225
Waiwera hot springs - - 81
———, sunken rocks off - - 82
Waka-huranga mount - - 212
Wakapuake bight - - - 190
———, end of submarine cables landed at 190
Wakaputa point - - - 286
Wakarewa mountains - - 240
Wakaroa point - - - 250
Wakatipa lake - - - 331
Wakori bluff - - - 117
Wakuru islet - - - 381
Walker rock - - - 174
Wanbrow cape, and light - - 257
Wanga point - 21, 78, 80, 82
Wangahu river - - - 153
Wangamomoo harbour - - 61
———, coast southward of - 61
Wanganui inlet, West coast, Middle island - - 344
———, tides - - 344
——— river, West coast, Middle island - - 336
———, do. 343
———, West coast, North island - 5, 153 to 156
———, coast westward of - 156
———, lights - - 155
———, local signals - 154
———, soundings off adjacent coast - 156
———, telegraph cable - 156
———, tides - - 156
Wangaparawa roadstead - - 109
Wangaparapara harbour - - 92
Wangape port - - - 203
Wangapoa river - - - 95
Wangaproa peninsula - 21, 82
——— anchorage - - 82
——— passage and directions - 21
——— sunken rock and other dangers - 21, 82

Page
Wangari - - - - - 5
——— bay - - - 67
——— coal mines - - - 73
——— harbour - - 67 to 73
———, anchorages 68, 69
———, directions - 69
———, tides - - 70
——— peninsula - - - 67
——— river - - - 70
———, directions - - 71
Wangaroa bay - - - 40
——— harbour - - 40 to 42
———, tides - - 42
Wangaruru harbour - 62, 63
———, directions - 63
———, tides - - 64
Wangawai river - - - 124
——— roadstead - - 124
Ward island - - - 140
Warekawa stream - - - 101
Weather islet - - - 274
Wedge island - - - 298
——— islet - - - - 101
Weita river - - - - 82
Weka islet - - - - 294
——— reef - - - - 294
Wekarua islands - - - 85
Welcome road - - - 307
Weld anchorage - - - 235
——— town - - - - 335
Wellington head, Cook strait - 170
———, Great Barrier island 91
——— province, population, &c. 5, 8
——— time ball - - 143
——— town, &c. - - 141
Wenuakura river - - - 157
Wero-wero river - - - 123
West bay - - - - 48
——— cape - - - - 314
——— coast of Auckland islands - 365
——— reef - - - - 382
Westland province - - - 5, 12
Westport township - - 5, 342
Wet jacket sound - - - 319
Whaingaroa harbour - 227, 228
———, anchorages and tides - 228
Whakaari head - - - 128
Whakamawahi arm - - - 181
Whakatane river - - - 107
Whale island (*Motu-hora*) - 107, 115

Page
Whale passage - - - 296
—— rock, bay of Islands - 55, 60
————, Preservation inlet - 308
Whalers home point - - 258
Whangamata river - - - 101
————————, anchorage outside - - 101
Whangara islet - - - 121
Whangaroa or port Hutt - 383, 384
——————————, anchorage 383
——————————, supplies - 384
——————————, tides 383, 384
Wharariki point - - - 118
————————, landing place - 118
Wharekahika village - - 111
Whare-kauri hill - - - 382
———— island, Chatham islands 378 to 385
Whare-orino mountain - - 232
Wharton, mount - - - 238
White bay, Cloudy bay - - 169
—— bluff, West coast, North island 232
————, Cook strait - - 168
—— cliffs, Blind bay - - 193
—— head, East coast, Middle island 268
————, West do. 335
—— island (*Whakari*) - 113, 116
—— islet, Whalers home point - 258
————, East coast, Middle island 266
—— rock, port Pegasus - - 296

Page
White rocks, Queen Charlotte sound 175
————, Stewart island 277, 300
————, Tory channel - - 171
Whora island - - - 80
Wide-berth islands - - 60, 64
William port - - 284, 290
————, islands off - - 290
———— Hamilton rock - - 386
Williams island - - - 189
Wilson bay - - - 297
Winds and weather - - 346 to 359
Windsor point - - - 288
Wirinaki river - - - 208
Wiwiki cape - - - 44
Wood head - - - - 323
—— hen cove - - 317, 319
———— island - - - 308
Woody head - - - 227
Woore mount - - 184, 186
Worser or Young bay - - 140
Wreck reef - - - - 294
Wright rock - - - 252

Yates point - - - 330, 331
Yellow cliffs - - - 334
Young bay - - - - 140
—— cape - - - 376, 381
—— Nick's head - - - 121
—— point - - - - 205
Yule islet - - - - 368

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4